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THE HUNTER-KILLER MODEL

DATABASE SYSTEM

USER'S MANUAL

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WARNINGS

1. DO NOT DELETE THE DBASE III FILES.

The dBASE III software is copy protected. It includes a special installation program which copies the software from the dBASE III System Disk 1 to the fixed disk. Some of this software is contained in hidden files which will not be listed when the DIR command is used. Also, the dBASE System Disk 1 contains a counter allowing only one copy to be made. As part of the installation, the program resets that counter to zero, showing that no more copies may be made.

To remove the dBASE III software from the fixed disk, the dBASE III UNINSTALL program MUST be used. This UNINSTALL program resets the counter on System Disk 1, allowing another copy to be made. If the dBASE III files are simply deleted from the fixed disk, dBASE III cannot later be re-installed. It is necessary to mail the no longer usable System Disk 1 and a \$20 fee to Ashton-Tate for replacement. Ashton-Tate does provide a backup copy of System Disk 1 which may be used if the original disk is damaged or if the dBASE III software is not properly uninstalled.

2. DO NOT DELETE DATABASES USING DOS.

The Hunter-Killer Database System maintains files describing what databases have been created. If these files or the databases themselves are deleted using DOS, the Database System may be unable to find all the files that have been created. Database files should only be deleted from within the Hunter-Killer Database System itself.

Similarly, the files should not be modified outside of the Hunter-Killer Database System using an editor. Only the generated run stream, which is a standard IBM AT file, may be examined using an editor.

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3. DO NOT PRINT REPORTS IF THE PRINTER IS NOT ON-LINE.

Due to the manner in which dBASE III and DOS communicate, if an attempt is made to print a report and the printer is not connected or is not turned on, dBASE III will abort back to DOS.

If the printer is not available, DOS displays the message "Abort, Retry, Ignore?" telling the user to choose the next action. The printer may be made ready and the retry option used; however, due to the DOS/dBASE III interface, this is the only action that will prevent exiting to DOS. To prevent a fatal error, the Hunter-Killer Database System always requires confirmation of a print command before printing a report.

4. DO NOT CHANGE DEFAULT DRIVES IF A DISKETTE IS NOT IN THE NEW DRIVE.

Due to the manner in which dBASE III and DOS communicate, if an attempt is made to change the default drive and the drive is not ready (a formatted diskette in the drive), dBASE III will abort back to DOS.

If the selected drive is not ready, DOS displays the message "Abort, Retry, Ignore?" telling the user to choose the next action. The drive may be made ready and the retry option used; however, due to the DOS/dBASE III interface, this is the only action that will prevent exiting to DOS. To prevent a fatal error, the Hunter-Killer Database System always requires confirmation of a change drive command before performing the action.

5. REGULARLY BACKUP THE DATABASES

If the disk on which the databases are stored is damaged, the data may be lost. To avoid loss of the databases, backups should be made whenever the files are changed.

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*****
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**                               **
**      WARNINGS                **
**                               **
*****
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6. USE MATCHING DRIVES AND DISKETTES.

There are two types of floppy diskette drives available on an IBM AT: high-capacity (1.2M bytes) and double-sided (320K bytes). The high-capacity drive is usually installed above the double-sided drive. Double-sided drives have an embossed asterisk on them whereas the high-capacity drives do not. The high-capacity drive is A and the double-sided drive is B.

There are also two types of diskettes, one for each type of drive, which are physically different and cannot be substituted for one another. Only double-sided diskettes can be used in the double-sided drive. Both types of diskettes can be used in the high-capacity drive, but a double-sided diskette written on by the high-capacity drive may not be readable in a double-sided drive. When formatting a double-sided diskette in the high-capacity drive, make sure the proper options are used as described in the DOS manual.

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1.0 INTRODUCTION

1.1 PURPOSE

This manual is intended for use by those who will use the Hunter-Killer Database System (HKDS) to maintain data for the Hunter-Killer Model. The HKDS has been implemented on an IBM AT personal computer to allow the system to be used independently of a mainframe computer. All data files are maintained on the IBM AT. When the model is to be run the HKDS generates a run stream which is then uploaded to the mainframe computer on which the model is maintained.

Other related manuals are:

The Hunter-Killer Database System Programmer's Manual. This manual describes the software which implements the HKDS and is intended for use by the HKDS maintenance programmer. Information is provided on the coding conventions used, how to maintain the HKDS, and how to install the HKDS on other computers.

The Hunter-Killer Model Version 1.1 Executive Summary. This manual provides a quick introduction to the Hunter-Killer Model.

The Hunter-Killer Model Version 1.1 User's Manual. This manual provides a description of the purpose of the model, the modeling techniques that were used, the data required to run the model, and the reports produced. It also provides instructions on using the Hunter-Killer Model.

The Hunter-Killer Model Version 1.1 Programmer's Manual. This manual provides details on the software that implements the model. It is intended for use by the model's maintenance programmer.

1.2 SECURITY

The system on which the Hunter-Killer Database System has been installed was assembled without regard to the special needs and requirements for safeguarding classified defense data. Prior to using the system to process classified data the user should contact the appropriate security officer for the necessary procedures.

1.3 PREREQUISITES

The Hunter-Killer Database System requires a personal computer running the dBASE III software. This manual is written specifically for the computer on which the HKDS was originally implemented, an IBM AT/370. This is an IBM AT personal computer with AT/370 and 3278/9 emulator boards added, along with the VM/PC operating system. These boards and software allow the AT/370 to be hardwired to an IBM mainframe operating under the Virtual Machine/System Product CMS operating system. These boards and software are only required if the IBM AT is to be hardwired to an IBM mainframe.

Communications with a mainframe may also be accomplished through a modem. This manual assumes the IBM AT has a Hayes 1200B modem and the Hayes SMARTCOM II software. These may be used to connect to any computer with dial-in capability.

The Hunter-Killer Database System has been implemented using the dBASE III (a trademark of Ashton-Tate) database management software; however, use of the HKDS does not require a direct knowledge of dBASE III. The HKDS uses a series of menu screens to guide the user through the system. The menus plus the information contained in this manual should be sufficient for using the HKDS.

Though a knowledge of dBASE III is not required, a basic knowledge of DOS is assumed. DOS commands to change directories, format disks, define substitute drives, or perform other functions are discussed without being described in detail. The IBM AT/370 requires DOS Version 3.0 or higher.

A knowledge of the SMARTCOM II software is also required if the Hayes modem is to be used to upload the generated run stream to a mainframe computer. Section 2.10 provides sufficient information to allow the user to upload to two computers, the MERADCOM CDC CYBER 835 and the NVL IBM 4341, without more than a cursory knowledge of SMARTCOM II.

It is assumed that the user is already familiar with the operating systems of those two computers. The CDC is using the NOS/BE operating system. The IBM is using the Virtual Machine/System Product (CMS) operating system.

The AT/370 hardware allows direct connection of the IBM AT to an IBM mainframe as if the AT were an IBM terminal. This hardware uses the VM/PC software package. This package is described in Section 2.11 in sufficient detail to allow the user to connect with the NVL IBM. This software is essentially the CMS operating system with a few additional commands to allow DOS ASCII files to be translated to CMS EBCDIC files.

The Hunter-Killer Model itself is not described within this manual. It is assumed the user already knows the model and knows the meaning and usage of the data maintained by the HKDS.

1.4 INQUIRIES

Inquiries concerning the Hunter-Killer Model or the Hunter-Killer Database System should be addressed to:

Night Vision and Electro-Optics Center
DELNV-V
Fort Belvoir, VA 22060

(703) 664-5845

2.0 USING THE DATABASE SYSTEM

This chapter provides information on using the Hunter-Killer Database System, from the start of a session to the end. An overview on editing a database is provided. The details of the data contained within each database that makes up the HKDS are given in Section 3.

2.1 CONCEPTS

2.1.1 Conventions Used in This Manual

All DOS and dBASE III commands discussed in this manual will appear in upper-case letters. All options that may be entered in the HKDS will be upper-case and will also be delimited by quote marks: "H". The quote marks are not to be entered, only the option displayed between them.

In the figures showing the HKDS screens, the positions where values are to be entered are indicated by underscores. On the actual screens these positions will be shown by a box of a different color than the background color.

2.1.2 Use of ID Numbers

The Hunter-Killer Database System consists of ten databases which divide the data into the same categories used by the Hunter-Killer Model. The databases are: Lasers, Probabilities of Kill, Sectors, Sensors, Type Platforms, Type Weapons, Controls, Defilade Fractions, Hunter-Killers (along with Move Vectors and Air Tactics), and Terrain.

The databases are interrelated through the use of ID numbers. Every piece of equipment in a database such as a laser, type platform, or hunter-killer has an ID number that is unique to that database. Additionally, each sector has a unique ID number. When one database refers to another database it does so through these ID numbers. For example, the description of a hunter-killer requires a hunter sensor, laser, and sector and a killer sensor, laser, and sector. The ID numbers entered in the Hunter-Killers Database will be used when a run stream is generated to extract from the appropriate databases the sensors, lasers, and sectors required for the run. ID numbers within a database are assigned by the user. The values may be from 1 to 999.

An option is provided on the main menu which causes all of these interrelationships to be verified. If a database contains an ID that is supposed to refer to a second database but the second database does not contain that ID, an error message is generated. This option is discussed in Section 2.7.

2.1.3 Single vs Multiple Version Databases

The ten databases are subdivided into two types: single version and multiple version. A single version database is one where only one list of values is desired, such as lasers. The parameters describing a laser's performance do

not change from run to run and, consequently, only one Laser Database containing all lasers must be maintained. The Hunter-Killers Database, however, will change often, depending on the scenario to be modeled. One scenario may have four blue versus thirteen red hunter-killers, whereas another scenario may have equal forces. Instead of requiring that the Hunter-Killer Database be changed for each scenario then changed back when the original scenario is again desired, the HKDS allows multiple versions of the Hunter-Killers Database to exist. Each database is identified by a two digit ID number assigned by the system. When a user wishes to modify a Hunter-Killers Database, it is necessary to select option "H" from the main menu, then select the specific database to be used (or choose to create a new one) before the modifications can be made.

The single version databases are: Lasers, Probabilities of Kill, Sectors, Sensors, Type Platforms, and Type Weapons.

The multiple version databases are: Controls, Defilade Fractions, Hunter-Killers, and Terrain. The database containing run streams also functions as a multiple version database.

2.1.4 Use of Menus

The HKDS is menu driven. When the system is started the main menu, Screen 0.0, is displayed. The option to be performed is selected. This will cause a secondary screen to be displayed. This screen will contain another set of options. Selecting another option may cause a third level screen to be displayed or an action to be taken, as appropriate. All screens are identified by a number in the upper right hand corner of the screen. The list of figures in the Table of Contents may be used to determine the page with detailed information on a screen.

The screen ID numbers are all of the form d.mn, where d identifies a function (e.g., changing the default drive) or a database and m identifies a screen used to list options or used to perform an option. N identifies a subscreen of Screen d.m. It is used when a single screen is insufficient for performing an option, such as editing a database using multiple subscreens. These subscreens will be numbered d.m1, d.m2, and so on.

The definitions for d are:

- 1 = Change the default drive
- 2 = Verify IDs
- 3 = Lasers Database
- 4 = Probabilities of Kill Database
- 5 = Sectors Database
- 6 = Sensors Database
- 7 = Type Platforms Database
- 8 = Type Weapons Database
- 9 = Controls Databases
- 10 = Defilade Fractions Databases
- 11 = Hunter-Killers, Move Vectors, and Air Tactics Databases
- 12 = Terrain Databases
- 13 = Run Streams

For single version databases, m may take on two values. M = 2 is the principal option menu for the database. M = 6 is the data verification screen.

For multiple version databases, m may take on more values as follows:

- 0 = Select an existing database or choose to create a new one
- 1 = Create a new database
- 2 = Options menu for modifying a selected database
- 3 = Change the description of a selected database
- 4 = Delete a selected database
- 5 = Edit a selected database
- 6 = Data verification for a selected database

These screens are discussed in general terms in Sections 2.4 and 2.5. Variations on these screens and additional screens specific to some databases will be discussed in Section 3.

The menus are in a tree structure as shown in Figure 2-1. Selection of an option must always move along the branches of the tree. It is not possible, for example, to go from the second level screen for the lasers directly to the second level screen for the sensors. It is always necessary to back out to the main menu, the root of the tree, before taking a new branch. The standard selections are to enter a letter or ID number to move to a secondary or tertiary level and to enter a "-" (minus sign) to back up to a higher level.

Options may be entered in upper or lower case letters. The HKDS will translate them to upper case. It is always necessary to enter a carriage return to cause the selected option to be executed.

When entering data, only the correct data type -- numeric or alpha -- will be accepted. If an attempt is made to enter an alpha character in a numeric field, the system will not accept the value. The system will behave as if no value had been entered. An alpha field will accept numerals.

2.2 STARTING A SESSION

2.2.1 Configuring the Computer

To use the Hunter-Killer Database System the computer on which it is installed must be configured properly. The basic requirements are listed in this section. Full details on configuring the computer and installing the system may be found in the HKDS Programmer's Manual.

- a) This manual assumes an IBM AT running under DOS Version 3.0 or higher is being used.

It is assumed that the AT/370 option and 3278/9 emulator boards have been installed. A description of the AT/370 option for the IBM AT computer may be found in Section 2.11, Direct Connection an IBM Mainframe. The AT/370 and 3278/9 emulator are not required: they are used for a direct connection to an IBM mainframe computer. Another technique such as a modem may be used to communicate with the mainframe on which the Hunter-Killer Model will be run. This is discussed in Section 2.10, Modem Connections to a Mainframe.

It is assumed that the IBM AT has two floppy diskette drives. Drive A is the high-capacity drive that is standard with an IBM AT. Drive B is a double-sided drive marked by an embossed asterisk. This drive may be used to transfer files to an IBM XT computer which only uses double-sided drives. Only one drive is required to install the software. After dBASE III and the HKDS software have been installed, all work may be performed on the fixed disk.

- b) The minimal CONFIG.SYS file on the computer must be as follows:

```
BUFFERS    = 20
FILES      = 20
LASTDRIVE  = J
```

BUFFERS and FILES may be larger. The LASTDRIVE may be set to any letter after H.

- c) Three directories must have been created: \DBASE, \DBASE\HKDS-20, \DBASE\JCL.

HKDS-20 stands for the Hunter-Killer Database System Version 2.0. This corresponds to version 2.0 of the model.

- d) Drive names must have been substituted for path names. The substitutions have been placed in the AUTOEXEC.BAT file so that they will be made each time the computer is started. The substitutions that must have been executed are:

```
SUBST G: C:\DBASE\JCL
SUBST H: C:\DBASE\HKDS-20
```

The directories \DBASE\JCL and \DBASE\HKDS-20 may be created with different names; however, the substitute drives must be G and H. The

HKDS assumes its software will be located on drive H, regardless of the specific directory name. Similarly, the HKDS will write run streams to drive G, regardless of the specific directory name associated with that drive. DBASE III support routines are assumed to be in directory \DBASE. Changing that name requires a change to the HKDS procedure HKDBASE.

- e) The dBASE III software must have been installed. This manual assumes it has been installed in directory \DBASE. The configuration file CONFIG.DB should be located in that directory and should contain the single command:

COMMAND = DO H:HKDBASE

This will cause the HKDS to start automatically as described in Section 2.2.2.

- f) The Hunter-Killer Database System Software must have been installed. This manual assumes it has been installed in directory \DBASE\HKDS-20.

2.2.2 Starting the HKDS

To start a session of the Hunter-Killer Database System it is necessary to change the default directory to the one in which dBASE III is located. Then, the start dBASE III command is entered:

```
CD \DBASE
DBASE
```

The computer will load dBASE III and display the licensing agreement. At the bottom of the screen will appear the lines

Press the F1 key for help
Type a command (or ASSIST) and press the return key (<-).

```
. DO H:HKDBASE
Press any key to continue...
```

Pressing any key will cause the Hunter-Killer Database System to initialize and display the main menu. If only the first two lines appear, the database configuration file CONFIG.DB described in Section 2.2.1 has not been installed. At this point dBASE III is in control instead of the HKDS. To start the HKDS enter the command:

```
DO H:HKDBASE
```

This will display the last line above. Press any key to start the system.

2.2.3 The Main Menu

After the HKDS has been initialized the main menu, Screen 0.0, will be displayed. From this screen any of the primary options may be chosen to modify databases, generate run streams, verify ID numbers, or quit the HKDS. This screen is shown in Figure 2-2.

Choosing any option except "Q" (quit) causes a secondary menu screen for the specific task to be displayed. As discussed earlier, it is necessary to return to this main screen in order to use a different database or to quit. It is not possible to switch directly from working with one database to working with another.

Selection of an invalid option will cause an error message to be displayed showing that option. A valid option may then be selected.

The Hunter-Killer Database System		0.0
Key Single Databases	Key Multiple Databases	
L Lasers	C Controls	
P Probabilities of Kill	F Defilade Fractions	
S Sectors	H Hunter-Killers,	
N Sensors	Move Vectors, Air Tactics	
K Type Platforms	T Terrain	
W Type Weapons		
or		
D Change the default drive (H:)	R Build a Run Stream	
	V Verify ID relationships	
Enter Key Letter or Q (Quit) _		

Figure 2-2, Screen 0.0 - The Main Menu

2.3 CHANGING DEFAULT DRIVES

When the HKDS is started it assumes that all database files will be found on drive H. This manual assumes that drive H is the substitute name for directory \DBASE\HKDS-20. The databases may instead be stored a floppy diskette. To change the drive:

- a) Place a formatted diskette in the drive to be used. If the diskette to be used is not formatted it will be necessary to exit from the HKDS, use the DOS FORMAT command, then restart the HKDS session.
- b) Go to the main menu and select option "D". Screen 1.0, shown in Figure 2-3, will be displayed. The warning and request for confirmation shown on the lower portion of the screen are not displayed until a new drive has been selected.
- c) Enter the drive to be used. The drive may be one of the floppy drives, A or B, or a substitute drive name.

WARNING: If the drive and diskette are not available, DOS will cause a message to be displayed: "Abort, Retry, Ignore?" If a diskette is available, insert it in the drive and enter "R" for retry. Due to the way in which dBASE III and DOS communicate, there is no other way to recover from this error. Selecting abort or ignore, or selecting retry without having a diskette inserted in the drive will cause dBASE III to exit back to DOS. It will then be necessary to restart the HKDS session.

WARNING: The drive type and the diskette type must match. Only a double-sided diskette may be used in the double-sided drive. This is drive B, marked with an embossed asterisk. Both double-sided and high-capacity diskettes may be used with the high-capacity drive, A, but double-sided diskettes written by the high-capacity may not be readable on a double-sided drive.

- d) Due to the potential for a fatal error when changing drives, the HKDS requires confirmation of the request. Reenter the new drive.
- e) The HKDS will take a few seconds to create all the files it requires on the diskette. When the system prompts for a new command, enter "-" to return to the main menu and continue.

If the databases will always be on a drive other than H, it will be easier to change the default drive in the HKDS source code instead of resetting it each time the HKDS is used. This change must be made to program HKDBASE. The change is described further in the Programmer's Manual.

The Hunter-Killer Database System		1.0
Change the Default Drive		
Current drive is H:		
Enter new drive or - to cancel _		
WARNING: Attempting to use floppy disk drive X:. IF NO DISK is in the drive you will be asked to Abort, Retry, or Ignore. all options will force you to exit to DOS.		
Reenter the drive to continue or - to quit _		

Figure 2-3, Screen 1.0 - Change the Default Drive

2.4 MULTIPLE VERSION DATABASES

The various multiple version databases have similar screens: in most cases, the only difference between the screens for different databases will be the titles. The screens for selecting a database, creating a new database, selecting options for a database, changing the database description, and displaying data verification errors are discussed in this section using the Controls Database as an example. Variations on the screens for each of the databases are discussed in Section 3.

2.4.1 Selecting a Database - Screen d.0

When a multiple version database is selected from the main menu, a secondary level screen is displayed. The screen has an ID of the form d.0, where d identifies the database. The screen for the Controls Database is shown in Figure 2-4. From this screen the user may select to edit a previously created database, create a new database, or return to the main menu. If an invalid database ID is selected the system will display an error message. The user may then select a valid database ID or other option.

As shown in Figure 2-4, each database has an ID number and a description of up to 60 characters. The ID number is assigned by the HKDS when a new file is created. The user is prompted for the description when the database is created. The description may be modified at a later time.

The Hunter-Killer Database System		9.0
Controls Databases		
01	Visibility = 1000; Low Resolution Terrain; No Defilade	
02	Visibility = 2000; High Resolution Terrain; Defilade	
Enter ID of database to be modified		
C	to create a new database	
+	to display more database names (if there are more than 10)	
-	to return to the main menu	

Figure 2-4, Screen d.0 - Selecting a Database

2.4.2 Creating a New Database - Screen d.1

The process for creating a new database is the same for all multiple version databases. From Screen d.0, where d identifies the database, select option "C". This will cause Screen d.1 to be displayed, as shown in Figure 2-5 for the Controls Databases. The figure shows the screen at the end of the creation process. The HKDS will add only a few lines at a time to the display as it prompts the user for more information.

- a) The screen will first display the ID number that has been assigned to the database. The user will be prompted for a database description of up to 60 characters.
- b) After the description has been entered, the screen will prompt for whether a completely new database should be created or if an existing database is to be copied into the new database for later modification.

If option "N" is entered, a new database will be created.

If option "C" is entered, the final prompt will be displayed asking for the ID of the database that is to be copied. If an invalid ID is entered an error message will be displayed. The user may then enter a valid ID. Entering a "-" will cancel the procedure.

- c) If the creation was successfully completed, Screen d.2 giving options for modifying the database will be displayed. This screen is described in Section 2.4.3. If the creation was canceled, Screen d.0 will again be displayed.

The Hunter-Killer Database System	9.1
<p>Controls Databases</p> <p>New database to be created has ID 03</p> <p>Enter file description, up to 60 characters:</p> <p>_____</p> <p>Start new file or Copy Existing File (N/C)? _</p> <p>Enter ID of database to be copied or</p> <p>- to cancel _</p>	

Figure 2-5, Screen d.1, Creating a New Database

2.4.3 Options for a Database - Screen d.2

If a database is selected from Screen d.0 or if a new database has been successfully created, Screen d.2 will be displayed. The screen presents the options available for modifying a database or printing a database report. Figure 2-6 shows Screen d.2 for Controls Database 01.

Selecting option "E" allows the database to be edited. Editing databases is described in Section 2.6.

Selecting option "D" allows the database to be deleted. Screen d.4 will be displayed, as discussed in Section 2.5.5.

Selecting option "C" allows the database description to be modified. Screen d.3 will be displayed, as discussed in Section 2.5.4.

Selecting option "R" causes a report to be printed. Printing reports is discussed in Section 2.8.

A Hunter-Killers Database consists of the hunter-killers file, movement controls, movement vectors, and air tactics. Consequently, additional options are displayed for editing each portion of the database. These variations on the basic screen are discussed in Section 3, Screen 11.2.

A Run Stream Database also has additional options allowing the building of a run stream, viewing of a run stream errors file, and printing the run stream and errors files. These variations on the basic screen are discussed in Section 2.9.

CONTROLS 01: Visibility = 1000; Low Resolution Terrain; No Defilade

Enter E to edit the database
D to delete the database
C to change the comment field
R to generate a report
- to return to the previous screen _

Figure 2-6, Screen d.2 - Options for a Database

2.4.4 Changing the Database Description - Screen d.3

After a database has been selected, choosing option "C" from Screen d.2 allows the description of the selected database to be modified. Screen d.3 will be displayed, as shown in Figure 2-7 for Controls Database 01.

The old description will be displayed and the cursor placed at the first character. The description may then be modified or deleted and completely re-entered.

Pressing the enter key will cause the cursor to move to the confirmation prompt. Entering "N" (no) will cause any changes that were made to be ignored. Entering "Y" (yes) will cause the changes to be recorded.

After the confirmation the HKDS will return to Screen d.2.

The Hunter-Killer Database System	9.3
<p>CONTROLS 01: Visibility = 1000; Low Resolution Terrain; No Defilade</p> <p>Comment field to be changed for database ID 01</p> <p>Comments: Visibility = 1000; Low Resolution Terrain; No Defilade</p> <p>Enter confirmation (Y/N) _</p>	

Figure 2-7, Screen d.3 - Changing a Database Description

2.4.5 Deleting a Database - Screen d.4

After a database has been selected, choosing option "D" from Screen d.2 allows a database to be deleted. Screen d.4 is displayed as shown in Figure 2-8 for Controls Database 01.

The ID and description of the database to be deleted are displayed. A confirmation of the deletion request is required. Entering "Y" (yes) will cause the deletion to be performed. Entering "N" (no) will cause the deletion to be canceled. If the deletion is canceled a message will be displayed stating that the deletion was not performed.

After the action has been completed the HKDS will return to Screen d.0, allowing another database to be selected.

The Hunter-Killer Database System		9.4
CONTROLS 01: Visibility = 1000; Low Resolution Terrain; No Defilade		
Ready to delete the following database		
Database ID: 01		
Comments: Visibility = 1000; Low Resolution Terrain; No Defilade		
Enter confirmation (Y/N) _		

Figure 2-8, Screen d.4 - Deleting a Database

2.4.6 Editing a Database - Screen d.5

Choosing option "E" from Screen d.2 will cause a selected database to be edited. One of two editing methods will be used, depending on the structure of the database. If single screen editing is used, screens will be displayed with IDs of the form d.5 or d.5n, where d identifies the database and n is a subscreen. Since these screens are specific to a database, an example is not shown here. If the browse editor is used, dBASE III controls the format of the display and no screen number will be shown. Section 3 shows the screens for each database.

The browse editor may be unable to display all attributes of a database on a single screen. In this case it is necessary to pan right and left within the database to modify all attributes. In those databases with more than one screen of attributes, Screen d.2 displays the rightmost attribute, as shown for FALSE_ALARM for lasers in Figure 2-11. This value can only be seen by panning right after the browse editor has been entered. Section 2.6.1 discusses panning using the browse editor.

Both editing techniques are discussed in Section 2.6.

2.4.7 Data Verification - Screen d.6

When the browse editor is used to edit a database, limited data verification is performed when browse is exited. Screen d.6, shown in Figure 2-9, is displayed to indicate that data checking is being performed. If errors are found in the data, the error messages will be displayed on the screen as shown in Figure 2-10. If more than one screen full of errors are detected a message will be displayed. Pressing any key will cause another screen of messages to be displayed.

The full list of errors produced by data verification appears in Appendix D.

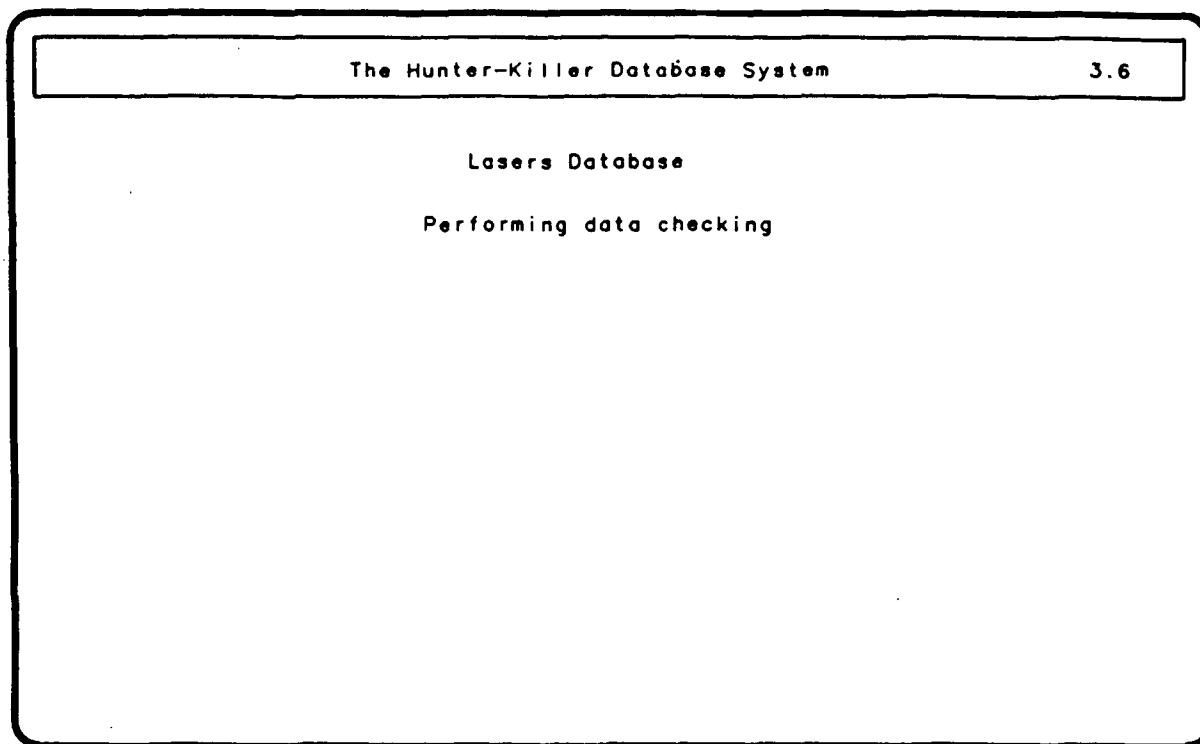


Figure 2-9, Screen d.6 - Data Verification

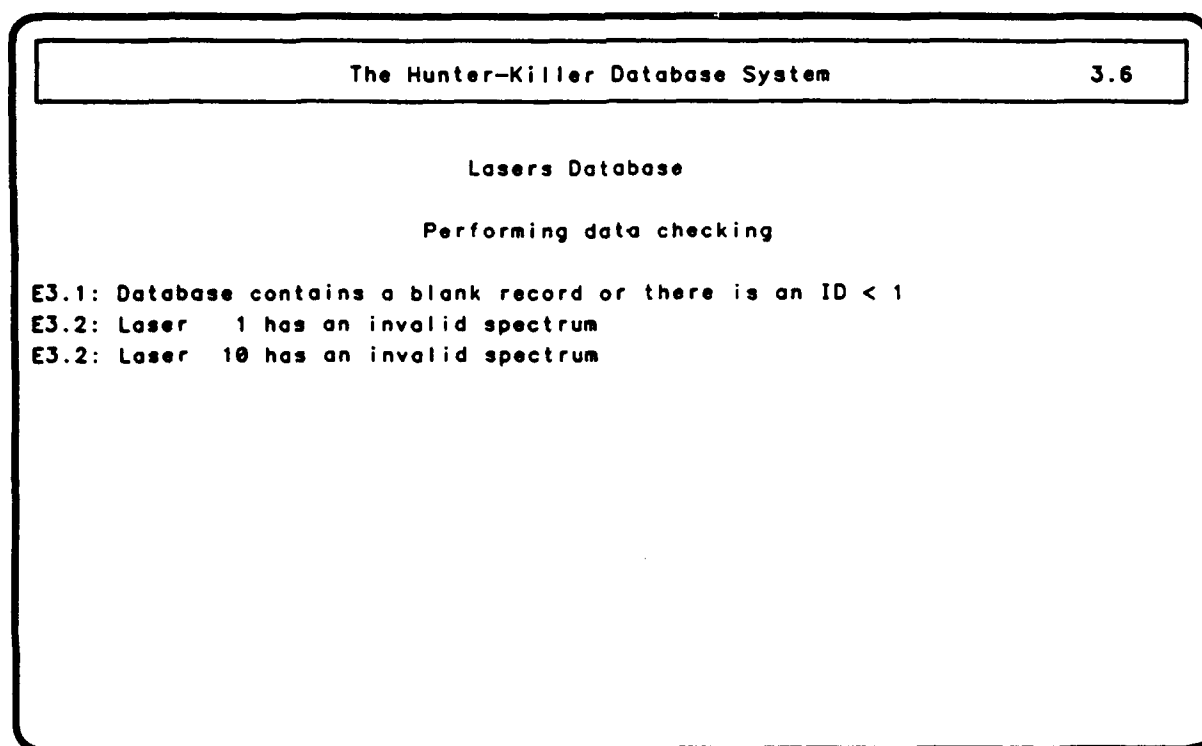


Figure 2-10, Screen d.6 - Data Verification Errors

2.5 SINGLE VERSION DATABASES

Since only one copy of single version databases exist, fewer screens are required. The screens for creating, deleting, and changing database descriptions are not used. Screens d.2 and d.6 are the only two required.

2.5.1 Single Version Database Options - Screen d.2

When a single version database is selected from the main menu, Screen d.2 is displayed immediately. There is no need to use a screen of the form d.0 to select a specific copy of the database. The screen will display fewer options than for multiple version databases, as shown for the Lasers Database in Figure 2-11. From this screen the user may select to edit the database, print a report, or return to the main menu. Use of the browse editor is discussed in Section 2.6.1. Printing a report is discussed in Section 2.8.

The Probabilities of Kill Database has a variation on this screen. Selecting the P option causes Screen 4.2 to be displayed. This is in the same format as that shown in Figure 2-11. If the edit option is selected the editor is not entered immediately; instead, Screen 4.21 is displayed. This screen allows the selection of a specific weapon/target combination whose PKs curve is then edited. Details on editing the Probabilities of Kill Database are in Section 3, Screen 4.21.

The Sensors Database also has a variation on these screens. Screen 6.2 also has options allowing the editing of the Resolution Curves Database. Details on the Sensors Database are in Section 3, Screen 6.2.

2.5.2 Verifying Data - Screen d.6

When the browse editor has been used to edit a database, limited data verification occurs when the browse editor is exited. This data verification produces the same display as discussed in Section 2.4.7 for multiple version databases.

The Hunter-Killer Database System	3.2
-----------------------------------	-----

Lasers Database

Enter E to edit the database
R to generate a report
- to return to the main menu

NOTE: The database has more data fields than can be displayed on one screen.
It will be necessary to pan right and left as shown on the help menu to edit
all fields.

The rightmost field is FALS_ALARM.

Figure 2-11, Screen d.2 - Single Version Database Options

2.6 EDITING A DATABASE

Based on the structure of a database one of two editing methods will be used: the dBASE III BROWSE full screen editor or a single HKDS screen. The browse editor will be used for a majority of the databases. It is the preferred method for files such as the Lasers Database where there are multiple entries which are most clearly displayed in columns.

A single HKDS screen will be used for files such as a Controls Database where there is a large set parameters, but only one copy of each. With this type of screen it is possible to display variable descriptions along with valid values that may be used.

2.6.1 The Browse Editor

The browse editor is the dBASE III full screen database editor. It is used for all single version databases: Lasers, Probabilities of Kill, Sectors, Sensors, Type Platforms, and Type Weapons. Additionally, it is used for the multiple databases Defilade Fraction, Hunter-Killers, Move Vectors, and for Line of Sight Probabilities within the Terrain Database. When the error files generated by ID Verification (option "V" from the main menu) or by building a run stream are to be examined, this editor is used.

When the option "E" is selected for one of the above databases, a screen will be displayed, as shown in Figure 2-12 for the Lasers Database. The first line identifies the number of the record being edited. That record is identified on the screen by being highlighted in a different color. The file name is also given.

The next four lines provide a help menu for the browse editor controls. The words refer to the special functions assigned to the numeric keypad. The character before another key means that the control key is to be pressed at the same time as the other key. These controls will be discussed in the order they appear on the screen.

Immediately below the help lines are the names of the attributes in the database. These will always be displayed as the user scrolls through the database. The attributes for each of the databases are discussed in Section 3.

"<-" and "->", the left and right arrows, move the cursor one character position.

"Home" and "End" move the cursor one field left and right.

"<-" and "->" cause the screen to pan right and left. As mentioned previously, many databases contain more attributes than can be displayed on a single screen. To see the other attributes it is necessary to pan right by pressing the control key and the right arrow at the same time, causing the leftmost attributes to be removed, the remainder of the screen to be shifted left, and new attributes displayed on the right. To pan left again, press the control key and the left arrow. Depending on the number of columns required to display a new attribute, it may be necessary to enter "<-" or "->" twice

Record No. 1 LASERS			
CURSOR <— —>	UP DOWN	DELETE	Insert Mode: Ins
Char: ← →	Record: ↑ ↓	Char: Del	Exit: ^End
Field: Home End	Page: PgUp PgDn	Field: ^Y	Abort: Esc
Pan: ^← ^→	Help: F1	Record: ^U	Set Options: ^Home

ID	SPECTRUM	PEAK_POWER	OPTIC_XMIS	BEAM_DIVER	REC_APERAT	NOISE_EQ_P	PULSE_WIDT
1	10.6	220000	0.72	0.50	56.40	2.90	60
2	10.6	5000000	0.60	0.50	70.00	5.00	8

Figure 2-12, Browse Editor Screen

to cause the new attribute to be displayed. The ID number in the first column will always be displayed during panning. Screen d.2, displayed before entering the browse editor, will give the name of the rightmost attribute, if that attribute is hidden.

The up and down arrows move the current record indicator, shown by highlighting, up or down one record.

PgUp and PgDn cause the display to be moved up or down by one whole page.

"F1" causes the help portion of the screen to be toggled on and off, allowing more lines of the database to be displayed.

"Del" causes the character under the cursor to be deleted.

"Y" deletes the data within the current field from the cursor position to the end of the field.

"U" marks the current record as being deleted. Whenever this record becomes the current record (the record is highlighted), the token "**DEL*" will appear at the top of the screen. Pressing "U" again will remove the delete marking. The record will not actually be deleted until the browse editor is exited: until that time the delete mark may be toggled on and off repeatedly.

"Ins" is a toggle for the insert mode. If the mode is on, as indicated by "INSERT" displayed at the top of the screen, new data will be inserted before the cursor and the remainder of the data field will be shifted right. When the mode is off, entering new data causes existing data to be overwritten.

"End" will cause any changes that were made to be saved. Limited data checking will be performed, as discussed in Sections 2.4.2 and 2.5.7. The HKDS will return to the screen that was displayed before entering the browse editor.

"Esc" will also cause the browse editor to be exited. Browse maintains a buffer that contains the current record. If "Esc" is used to leave browse, changes made to the current record since the most recent time it became the current record will not be saved. If a record is changed, another record made the current record, then the original record made the current record again, the first changes will still be saved even if "Esc" is used. Data checking will be performed and the HKDS will return to the screen that was displayed before entering browse.

"Home" will cause five more options to be displayed, as shown in Figure 2-13. A short description of the option appears at the bottom of the screen. An option is selected by using the right and left arrows to move a highlighted area over the desired option. "Bottom" causes the browse editor to move to the bottom of the file. "Top" causes it to move to the top. Selecting "Record #" will cause a prompt to appear asking for the specific record to be displayed. "Seek" will prompt for a value. The database key field will then be searched for the record with that value. The key field in all databases is the ID. The "Lock" and "Freeze" options should not be used unless the user is familiar with dBASE III. Pressing "Home" again will remove the additional options from the display.

A record's number is not necessarily its displayed sequence position. A new record is added to the end of the file and its record number is its position relative to the top of the file. The display, however, is indexed by the ID numbers in the file, causing the display order to differ from the record number order.

New records may be added to a database by advancing to the bottom of the file. Pressing the down arrow to move past the bottom of the file causes a message to be displayed at the top of the screen: "=> Add new records? (Y/N) _". Entering "Y" in response will cause a blank record to be added to the bottom of the file, allowing new data to be entered. Entering a null record or entering the up arrow will turn off the input mode. The file will be resorted to display the new records in correct ID order. Changing an ID will also cause the file to be resorted and the display to be changed.

Bottom	Top	Lock	Record #	Freeze	Seek	
CURSOR <— —> Char: ← → Field: Home End Pan: ^← ^→		UP DOWN Record: ↑ ↓ Page: PgUp PgDn Help: F1		DELETE Char: Del Field: ^Y Record: ^U		Insert Mode: Ins Exit: ^End Abort: Esc Set Options: ^Home
ID- SPECTRUM PEAK_POWER OPTIC_XMIS BEAM_DIVER REC_APERAT NOISE_EQ_P PULSE_WIDT 1 10.6 220000 0.72 0.50 56.40 2.90 60 2 10.6 5000000 0.60 0.50 70.00 5.00 8						
Go to BOTTOM of file						

Figure 2-13, Additional Browse Options

2.6.2 Single Screen Editing

A single screen is used to present data where there is only a single entry for each data type. Single screens are used for Controls, Move Controls and Air Tactics within a Hunter-Killers Database, and Terrain. These screens all have IDs of the form d.5. An example is shown below. The remainder of the screens are presented in Section 3.

Editing a Controls Database requires four screens, 9.51 to 9.54. The second of these screens is shown in Figure 2-14. Editing on these screens is straightforward. The up and down arrow keys move the cursor from one field to another. The right and left arrows move the cursor within a field. Pressing the enter key causes the cursor to advance to the next field.

The Insert key (the zero on the numeric keypad) functions as a toggle. When pressed once, entering data into a field causes the existing data to be overwritten. When pressed again, new data will be inserted before the cursor and old data will be shifted right. The insert mode is on when "INSERT" appears in the upper righthand corner of the screen.

Each screen will have the message "_ Continue to next screen (Y/N)?" in its lower lefthand corner. When a screen is first displayed, the cursor will be located at this prompt. The HKDS will not advance until "Y" has been entered in response to this prompt. DBASE III processes an entire screen of inputs at once; consequently, entering a "Y" followed by an enter will not cause the screen to be advanced immediately. The cursor must be moved to the last field on the screen, either with the down arrow or by pressing the enter key repeatedly. After the cursor is on the last field another down arrow or enter will cause the HKDS to advance to the next screen. Another way to advance is to enter the "Y" and press the PgUp or PgDn keys (3 or 9 on the numeric keypad). Either key causes the HKDS to process the entire screen immediately.

Limited data checking is performed on some screens. The continue to next screen prompt must be set to "N". If the cursor is placed on the last field and the enter key pressed, or if the PgUp or PgDn keys are pressed, the data checking will be performed. The screen will continue to be displayed; however, the first column of each line with an error will contain an asterisk to mark the error, as shown in Figure 2-15. The message "** MARKS LINES WITH ERRORS" will be displayed. The errors may be corrected and the process repeated. The continue to next screen prompt may then be set to "Y" to allow the next screen to be displayed.

After all screens required to edit the database have been displayed the HKDS returns to Screen d.2.

OUTPUT CONTROLS

Continue to next screen (Y/N)?

Figure 2-14, Single Screen Editing

OUTPUT CONTROLS

Continue to next screen (Y/N)?

• MARKS LINES WITH ERRORS

Figure 2-15, Single Screen Editing with Errors

2.7 VERIFYING IDS

As discussed in Section 2.1.2, the databases are all interrelated through the use of ID numbers. When adding data to one database it is easy to forget the correct ID numbers to be referenced. Option "V" from the main menu allows the user to ensure that all references are to valid IDs.

Selecting option "V" causes Screen 2.0 to be displayed, as shown in Figure 2-16. The date and time that verification was last performed are shown. Next a message will be displayed indicating if the last verification errors file still exists or has been deleted. Finally, the list of options appears.

Selecting option "V" causes the verification process to be performed. All single databases are examined to ensure that the IDs are valid; i.e., all IDs are between 1 and 999. The Probabilities of Kill Database is examined to ensure that all weapon IDs and target IDs also appear in the Type Weapons and Type Platforms Databases. Similarly, all multiple version databases are examined to ensure that all IDs in them that refer to other databases actually appear in those databases.

After the process has been completed a message will be displayed indicating if any errors were found. If any errors were found a file of error messages was created. It is possible to examine this file by using the "E" option, which employs the browse editor discussed in Section 2.6.1. A sample file is shown in Figure 2-17. The file may be printed by selecting the "P" option.

WARNING: As explained in Section 2.8, a fatal error will occur if the "P" option is selected and the printer is not ready. To prevent this fatal error the HKDS will prompt for confirmation of the print command before continuing.

After the error messages file has been examined it may be deleted by choosing option "D". If the file is not deleted it will be overwritten the next time option "V" is selected.

The full list of errors produced by the ID Verification option appears in Appendix C.

The Hunter-Killer Database System	2.0
<p>Verify Database ID Relationships</p> <p>This procedure determines if the IDs cross-reference properly: for example, if the Type Weapon IDs in the Type Targets database are all valid.</p> <p>Verification last performed on MM/DD/YY at HH:MM:SS</p> <p>No verification errors file exists.</p> <p>Enter E to edit the errors file D to delete the errors file P to print the errors file V to verify IDs - to return to the main menu _</p>	

Figure 2-16, Screen 2.0 - ID Verification

Record No. 1 VERIFY			
CURSOR <— —> Char: ← → Field: Home End Pan: ^← ^→	UP DOWN Record: ↑ ↓ Page: PgUp PgDn Help: F1	DELETE Char: Del Field: ^Y Record: ^U	Insert Mode: Ins Exit: ^End Abort: Esc Set Options: ^Home
COMMENTS I4.1: PKs database Weapon ID 14 Platform ID 15 has invalid Weapon ID I4.2: PKs database Weapon ID 14 Platform ID 101 has invalid Platform ID I4.3: PKs database Weapon ID 100 has values for non level 4 Platform ID 5 I10.1: Defilade database 01 has data for G sensor vs invalid Platform ID 101 I11.5: HKs database 02 HK ID 5 has invalid hunter laser ID 3 I11.5: HKs database 02 HK ID 5 has invalid hunter sector ID 100			

Figure 2-17, ID Verification Errors

2.8 PRINTING A REPORT

Reports are available for all of the databases. Additionally, after a run stream has been generated the stream and the error file (if any) may be printed. The error file generated by the ID verification option may be printed. Samples of the database reports are shown in Appendix B.

Printing any of these reports is easily accomplished. For the single version databases it is necessary to go to the second level screen giving editing options, Screen d.0. For the multiple version databases and the run streams it is necessary to go to the second level screen, Screen d.0, and select a specific database, causing the third level screen to be displayed, Screen d.2. The final screen in either case will list an option which causes the report to be printed.

If option "V" is selected from the main menu, the second level ID Verification option screen, Screen 2.0, is displayed. This screen contains an option causing the report to be printed.

In the case of a run stream, run stream errors, or verification errors file, if the file has not been generated the screen will display a message indicating that the file does not exist.

WARNING: The printer must be connected, turned on, on-line, and have paper. If the printer is not ready, DOS will cause a message to be displayed: "Abort, Retry, Ignore?" If the printer is then made ready and the retry option is used, the report will print. This is the only way to recover from this error. Due to the interface between dBASE III and DOS, if the printer cannot be made ready any of the options will cause dBASE III to exit back to DOS. It will then be necessary to restart the HKDS session.

To avoid errors of this type, selection of a print option always causes a warning to be printed. Confirmation of the print option must then be entered before the print will be attempted.

The HKDS always transmits a form feed before printing a report. This may cause paper to be wasted if a report is printed, then the printer advanced one page so that the report may be read, then another report printed. Blank pages will then appear between reports. If several reports are to be printed one after another, there will be less waste if all of the reports are printed before removing them from the printer.

2.9 GENERATING A RUN STREAM

2.9.1 Selecting a Run Stream

In order to execute the Hunter-Killer Model it is necessary to use the Hunter-Killer Database System to generate a run stream which must then be uploaded to the mainframe on which the model is stored. To generate a run stream, select option "R" from the main menu. This will cause a multiple version database screen d.0, of the same format as shown in Figure 2-4, to be displayed. Then, either enter "C" to create a new database (see Section 2.4.2) or the ID of an existing database that is to be used. Once a Run Stream Database has been created or selected, Screen 13.2 will be displayed, as shown in Figure 2-18. This screen gives all the options required to set the run stream controls and then build the run stream.

Options "C", "D", and "R" function in the same manner as for any multiple version database. Section 2.4 describes these options.

The Hunter-Killer Database System		13.2
STREAMS 01: Standard Run		
Enter E to edit	the database	B to build the run stream
D to delete	the database	F to edit the run stream error file
C to change	the comment field	L to print the run stream file
R to generate a report		P to print the run stream error file
		X to delete the run stream & error files
- to return to the previous screen _		
Note: the run stream file is too large to be edited from within dBASE III		

Figure 2-18, Screen 13.2 - Run Stream Options

2.9.2 Setting the Run Stream Controls

Selecting option "E" will cause two screens, 13.51 and 13.52, to be displayed. These screens are used to set the controls which determine the Controls and Hunter-Killers Databases to be used to build the run stream.

Screen 13.51 is shown in Figure 2-19. On this screen a description of up to four lines may be entered. The first line of the description will be used as a title for each page of output generated by the Hunter-Killer Model. All four lines will appear on the first page of output.

The IDs of the Controls Database and the Hunter-Killers Database to be used are entered next. Only these two databases need to be specified: all other databases are accessed based on values given in these two. For example, the Hunter-Killers Database specifies the IDs of lasers, sensors, sectors, and type platforms. When the run stream is built the Hunter-Killers Database is examined first to determine which lasers are required, then the Lasers Database is used to extract data for those lasers only. The same procedure is followed for sensors, sectors, and type platforms. The selected type platforms specify the IDs of the weapons required, which are then extracted from the Type Weapons Database.

Entering "Y" in response to the "Continue to next screen" prompt will cause the HKDS to continue.

The next screen to be displayed is 13.52, shown in Figure 2-20. This screen allows values within the selected databases to be overridden. For example, a common use of the Hunter-Killer Model is to make a series of runs testing performance as a function of visibility. One technique would be to create a set of Controls Databases which are identical except for the visibilities. Next, each time one of the run streams is generated the Run Stream Database would be edited to change the Controls Database ID. A simpler technique is to use the same Controls Database, but allow the visibility to be modified when the run stream is built.

The values that may be changed when the run stream is generated are: visibility, blue hunter sensor and laser IDs, blue killer sensor and laser IDs, red hunter sensor and laser IDs, and red killer sensor and laser IDs. A zero value in any of these fields means the value in the database will not be overridden.

The Hunter-Killer Database System	13.51
-----------------------------------	-------

STREAMS 01: Standard Run

Last run usage - Run stream generated MM/DD/YY at HH:MM:SS

Enter a run description. The first line will appear as a header on each page of output. All four lines will appear on the first page of output.

Choose the databases to be used:

Controls ___

Hunter-Killers ___

__ Continue to next screen (Y/N)?

Figure 2-19, Screen 13.51 - Run Stream Controls

The Hunter-Killer Database System	13.52
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STREAMS 01: Standard Run

To override the visibility in the controls database, enter a value:

New Visibility _____ meters

To override the sensors or lasers in the Hunter-Killers database:

	BLUE		RED
	Hunter	Killer	Hunter Killer
Sensor ID	___	___	___ ___
Laser ID	___	___	___ ___

__ Continue to next screen (Y/N)?

Figure 2-20, Screen 13.52 - Run Stream Overrides

2.9.3 Building a Run Stream

Selecting option "B" from Screen 13.2 causes Screen 13.7 to be displayed. This screen is shown in Figure 2-21. The entire screen is not displayed at once; instead, lines are added to the screen as each prompt is answered.

The first prompt is for the mainframe computer on which the model is to be run: "CDC" or "IBM". Selecting "CDC" causes a run stream to be built which contains the NOS/BE commands required for a batch run of the model followed by the data. Selecting "IBM" builds a run stream containing data only.

The HKDS then checks for the existence of the Controls and Hunter-Killers Databases specified in the run stream. If they do not exist an error message is displayed and the build procedure halted. If they do exist a prompt is displayed asking if the procedure should be continued. Entering "Y" will cause the run stream to be built.

If "CDC" was used the user is prompted for the user name to be used on the NOS/BE task card, the ID of the account on which the Hunter-Killer Model LGO module is stored, and the ID of the account on which the model's output is to be cataloged. If "IBM" was selected, these additional prompts will not appear.

Building the stream may take a few minutes. As each portion of the stream is written a progress message is displayed.

After the stream has been built, a message will be displayed giving the name of the file on substitute disk drive G which contains the stream. The name will be of the form STREAMnn.JCL, where nn is the ID number of the Run Stream Database being used. A message will also be displayed indicating if any errors were found. A sample of a generated run stream appears in Figure 2-22.

The Hunter-Killer Database System	13.7
<p>STREAMS 01: Standard Run</p> <p>Building a run stream for the CDC mainframe</p> <p>Run Description:</p> <p>Line 1 will appear at the top of each page of Hunter-Killer Model output. Lines 2 through 4, if not blank, will also appear on the first page of output.</p> <p>Database IDs:</p> <p>Controls ____</p> <p>Hunter-Killers ____</p> <p>Enter user name with no embedded blanks (for task card) _____</p> <p>Enter account on which the load module is stored _____</p> <p>Enter account to which the output is to be cataloged _____</p>	

Figure 2-21, Screen 13.7 - Building a Run Stream

TITLE 3

STANDARD RUN
 RUN STREAM GENERATED 09/08/86 AT 10:11:27
 CONTROLS=01 HUNTER-KILLERS=01 DEFILADE=01 TERRAIN=(LOW) 01

STOP
 CONTROLS

```

RUN
  NUM.OF.REPS      10
  REP.LENGTH       60 MINUTES
  IN.DEFILADE      YES
  TERR.RESOLUTION  LOW
  SMOKE.SWITCH     NO
  FIXED.AZIMUTH    NO
OUTPUT
  DATA.ECHO       YES
  REPLICATION.ECHO YES
  REPORT.CONTROL   2
  REPORT.INTERVAL  15 MINUTES
  GENERAL.TRACE    NO
  SEARCH.TRACE     NO
  TERRAIN.TRACE    NO
SEARCH
  VISIBILITY       1000 METERS
  MIN.DECT.TIME    5.00 SECONDS
  LIGHT.LEVEL      0.00000 FOOT-CANDLES
  PROB.BLUE.BIFF   0.00
  PROB.RED.BIFF    0.00
  SKY.TO.GROUND.RATIOS
    BAND .4-.7  3.00
    BAND .4-.9  2.66
    BAND .6-.9  2.66
  ABSORPTION.COEFFICIENTS
    BAND 3-5    0.10 1/KILOMETERS
    BAND 8-12   0.10 1/KILOMETERS
  JOHNSON.CRITERIA
    NAME  MRC  MRT
    DETECT 1.0 1.0
    CLASSIFY 2.0 2.0
    RECOGNIZE 4.0 4.0
    IDENTIFY 8.0 8.0
  PGM.DEGRADE.CURVE
    RANGE FACTOR
      0 1.00
    500 0.50
  
```

STOP

Figure 2-22, Sample Run Stream

SECTORS 3

ID	HORZ FOS	VERT FOS
11	60.00	9.00
12	120.00	12.00
13	100.00	9.00

STOP

LASERS 1

ID	SPCTRM	PEAK	PWR	XMISS	DIVER	APERT	NEP	PULSE	FLS	ALM
1	10.6	220000	0.72	0.50	56.40	2.90	60.00	0.01		

STOP

SENSORS 3

ID	SPECTRUM	HORZ WFOV	VERT WFOV	FOV SCALING	SWITCH DELAY	S/N FACTOR	POT FACTOR
1	8-12	15.00	8.00	3.00	5.00	0.000	0.000
2	8-12	13.50	6.75	3.00	5.50	0.000	0.000
3	8-12	2.33	1.75	1.00	0.00	25.702	25.073

STOP

RESOLUTION.CURVES

1 NFOV MRT 0.00000								
0.0000	0.0000	0.1000	1.6883	0.2000	0.2702	0.3000	3.3821	
0.4000	3.8677	0.5000	4.2319	0.6000	4.5154	0.7000	4.7422	
0.8000	4.9279	1.0000	5.2138	1.5000	5.6508	2.0000	5.8980	
3.0000	6.1678	4.0000	6.3121	5.0000	6.4020	6.0000	6.4634	
7.0000	6.5080	8.0000	6.5418	9.0000	6.5684	10.0000	6.5898	
2 NFOV MRT 0.00000								
0.0000	0.0000	0.1000	1.6883	0.2000	2.7020	0.3000	3.3821	
0.4000	3.8677	0.5000	4.2319	0.6000	4.5154	0.7000	4.7422	
0.8000	4.9279	1.0000	5.2138	1.5000	5.6508	2.0000	5.8980	
3.0000	6.1678	4.0000	6.3121	5.0000	6.4020	6.0000	6.4634	
7.0000	6.5080	8.0000	6.5418	9.0000	6.5684	10.0000	6.5898	
3 NFOV MRT 0.00000								
0.0000	0.0000	0.1000	1.6883	0.2000	0.2702	0.3000	3.3821	
0.4000	3.8677	0.5000	4.2319	0.6000	4.5154	0.7000	4.7422	
0.8000	4.9279	1.0000	5.2138	1.5000	5.6508	2.0000	5.8980	
3.0000	6.1678	4.0000	6.3121	5.0000	6.4020	6.0000	6.4634	
7.0000	6.5080	8.0000	6.5418	9.0000	6.5684	10.0000	6.5898	

STOP

TYPE.WEAPONS 2

ID	NAME	DESIGNATOR	SPEED	RELOAD
100	"M1 GUN	" NONE	0	5.0
200	"T72 GUN	" NONE	0	5.0

STOP

Figure 2-22, (continued)

TYPE.PLATFORMS 5

ID	NAME	LEVEL	OWNER							
1	"TGT	"	1	0						
2	"TRACK	"	2	1						
5	"TANK	"	3	2						
100	"M1	"	4	5						
200	"T72	"	4	5						
PRIOR TYPE										
ID	COLOR	ITY	WPN	CLASS	HEIGHT	X-SEC	DELTA.T	REFLEC-TANCE	CONTRAST	
100	BLUE	1	100	GROUND	2.40	7.9	1.50	0.50000	0.00	
200	RED	1	200	GROUND	2.30	6.5	1.50	0.00637	0.00	

STOP
SSPKS

TYPE	TYPE	RANGED		UNRANGED		
WPN	PLAT	RANGE	PK	PK		
100	200	0	0.90	0.80		
		500	0.86	0.61		
		1000	0.67	0.41		
		1500	0.46	0.22		
		2000	0.30	0.10		
		2500	0.19	0.05		
		2510	0.00	0.00	STOP	
200	100	0	0.00	0.80		
		500	0.00	0.61		
		1000	0.00	0.41		
		1500	0.00	0.22		
		2000	0.00	0.10		
		2500	0.00	0.05		
		2510	0.00	0.00	STOP	

STOP
DEFILADE.FRACTIONS.VISIBLE

CLASS	TYPE PLAT	RANGE	FRACTION	
GROUND	100	0	1.00	
		3000	0.60	
		6000	0.00	STOP
GROUND	200	0	1.00	
		3000	0.65	
		7000	0.00	STOP

STOP

Figure 2-22, (continued)

HUNTER.KILLERS 17

ID	TYPE PLAT	COORDINATES		HUNTER					KILLER				
		X	Y	SEN	LAS	SEC	AZI	LEV	SEN	LAS	SEC	AZI	LEV
101	100	200	135	3	0	12	90	1	1	1	11	90	3
102	100	200	260	1	0	12	90	1	1	1	11	90	3
103	100	200	385	1	0	12	90	1	1	1	11	90	3
104	100	200	510	1	0	12	90	1	1	1	11	90	3
201	200	4200	20	0	0	13	90	1	2	0	11	272	1
202	200	4200	70	0	0	13	90	1	2	0	11	272	1
203	200	4200	120	0	0	13	90	1	2	0	11	272	1
204	200	4200	170	0	0	13	90	1	2	0	11	271	1
205	200	4200	220	0	0	13	90	1	2	0	11	271	1
206	200	4200	270	0	0	13	90	1	2	0	11	270	1
207	200	4200	320	0	0	13	90	1	2	0	11	270	1
208	200	4200	370	0	0	13	90	1	2	0	11	270	1
209	200	4200	420	0	0	13	90	1	2	0	11	269	1
210	200	4200	470	0	0	13	90	1	2	0	11	269	1
211	200	4200	520	0	0	13	90	1	2	0	11	268	1
212	200	4200	570	0	0	13	90	1	2	0	11	268	1
213	200	4200	320	0	0	13	90	1	2	0	11	270	1

STOP
MOVEMENT

MOVE.INTERVAL 100 METERS
ID SEQ AZI SPEED ALTITUDE DISTANCE

201	1	270	8	0	4000	STOP
202	1	272	8	0	4000	STOP
203	1	272	8	0	4000	STOP
204	1	271	8	0	4000	STOP
205	1	271	8	0	4000	STOP
206	1	270	8	0	4000	STOP
207	1	270	8	0	4000	STOP
208	1	270	8	0	4000	STOP
209	1	269	8	0	4000	STOP
210	1	269	8	0	4000	STOP
211	1	268	8	0	4000	STOP
212	1	268	8	0	4000	STOP
213	1	268	8	0	4000	STOP

STOP
AIR.TACTICS

POPUP.MIN.TIME.DOWN 0 SECONDS
POPUP.MAX.TIME.UP 0 SECONDS
ATR.MAX.TIME.UP 0 SECONDS
ATR.TGT.RECOG.TIME 0 SECONDS

MOVE

SCOUT TACTICS INTERVAL ATTACK PLATFORMS

STOP

Figure 2-22, (continued)

TERRAIN.CONTROLS

MU.LOS 1.000 MINUTES
MU.NLOS 0.001 MINUTES

STOP

INITIAL.LINE.OF.SIGHT

RANGE	PROB
-------	------

0	1.00
---	------

2000	0.75
------	------

7000	0.40
------	------

10000	0.00
-------	------

STOP

Figure 2-22, (continued)

2.9.4 Examining a Run Stream

The remaining options from Screen 13.2 allow the generated run stream errors file to be examined. Selecting option "F" invokes the browse editor to look at the error messages. If there is no error messages file, a message saying so will be displayed. The complete list of error messages that may be generated is in Appendix E. The error messages file may be printed by selecting option "P".

The run stream itself is too large to be examined through the browse editor. Selecting option "L", however, will cause it to be printed. It is also possible to exit the HKDS and use another editor to look at the file.

After the run stream and error messages files are no longer needed, option "X" will cause them to be deleted. The Run Stream Database will not be deleted: this can only be done using option "D".

2.10 MODEM CONNECTIONS TO A MAINFRAME

This section describes how to take the run stream generated in Section 2.9 and upload it using a modem to the mainframe computer on which the Hunter-Killer Model is maintained. It is assumed the Hayes SMARTCOM II software will be used to drive a Hayes 1200B modem. Uploading to the two computers on which the model is currently installed, the MERADOM CDC CYBER 835 and the NVL IBM 4341, are discussed. The CDC computer uses the NOS/BE operating system. The IBM computer uses the Virtual Machine/System Product (CMS) operating system.

Using the AT/370 and 3278/9 hardware with the VM/PC software to make a direct connection to the NVL IBM is discussed in Section 2.11.

2.10.1 Starting SMARTCOM

To start SMARTCOM II it is necessary to change the default directory to the one in which the SMARTCOM software is stored then given the start command. It is assumed that the software is in directory \SMARTCOM. Changing the directory is necessary since SMARTCOM looks for configuration files in the default directory. The commands which must be given are:

```
CD \SMARTCOM
SCOM
```

The system will display a temporary screen while initializing itself, then will show the SMARTCOM main menu screen.

The AT/370 as delivered has a SMARTCOM configuration file and two communication sets. The configuration file provides SMARTCOM with details concerning the system on which it has been installed. The communication sets define specific parameters, such as baud rate, that are needed to communicate with specific computers. The two sets provided are for the MERADCOM CDC and the NVL IBM.

Macros have been provided for both sets. Macros are sets of mainframe commands (NOS/BE or IBM CMS) which are transmitted automatically once the macro has been selected.

Details on configuring SMARTCOM, defining communication sets, and defining macros may be found in the SMARTCOM II User's Guide.

2.10.2 Uploading to the MERADCOM CDC

Communication set P has been defined to allow communications with the MERADCOM CDC. To start communications, enter option "1" from the SMARTCOM main menu. Next, enter "0" to originate a call. Then, enter option "P" as the communication set to be used. SMARTCOM then automatically dials the computer. When a carrier signal has been established, SMARTCOM beeps and displays a blank screen. Entering a carriage return will cause the computer center to respond with ENTER HELP, which is the message from the switch that determines which computer will be used. From this point on, communications are the same as for any terminal.

Two macros have been provided. Entering (F5)A, where F5 is function key 5, causes macro A to be transmitted. This macro contains the following NOS/BE commands:

```
SCREEN,132
EDITOR
F,CH=72,T=;,4,7,10,13,16,19,31
F,S
```

The SCREEN command is necessary if the printer is to be used. The default screen width is 72. If CDC is transmitting a line longer than 72, it breaks the line after column 72, transmits a line feed, then transmits the remainder of the line. The printer will show this same format. By setting SCREEN to 132, the entire line is transmitted. SMARTCOM will wrap the line correctly when displaying to the screen. The printer receives the entire line unbroken by a line feed.

The editor is then entered and tab positions set. The tabs shown above are those used in the Hunter-Killer source code. The editor settings are then displayed.

The second macro is executed by entering (F5)B. This macro causes the terminal to be logged off from the editor. The commands transmitted to the mainframe are:

```
BYE
LOGOUT
```

To upload the data file requires entering the CDC editor, putting it into input mode, transmitting the file, then saving the mainframe file. The steps are as follows:

a) Once connected with the CDC, transmit macro A by entering "(F5)A." The editor prompt of two periods should be displayed.

b) Change the file width to 80 characters for the data file:

```
F,CH=80
```

c) Start a new file.

```
CREATE,S
```

This command puts the editor into input mode. The "S" option suppresses the display of the line numbers. If the "S" option is not used, the display will become confused as SMARTCOM tries to transmit the data file at the same time that the CDC is trying to transmit line numbers. The transmitted file will be correct: it is only the display during the uploading that will appear to be wrong.

- d) Enter "(F1)" to show the SMARTCOM main menu. Select option "5", Send File. The system will prompt for the transmission method:

- 1) Error Free 2) Start/Stop, 3) Send Lines

- Select option "2", Start/Stop.

- SMARTCOM will prompt for the file name. Enter the name using the form G:filename.JCL, since the HKDS stores the run streams on substitute drive G.

- SMARTCOM will now transmit the file to the mainframe. The editor will accept the file as if it had been typed in using the keyboard.

- e) Turn off the input mode by entering an equals sign:

- =

- f) It will be necessary to use the editor to include the user's CDC password on the second line of the run stream.

- g) The file may now be saved.

- h) The run stream file may now be executed as described in the Hunter-Killer Model User's Manual.

2.10.3 Uploading to the NVL IBM

Establishing telephone communications with the IBM is similar to doing so for the CDC. From the SMARTCOM main menu enter option "1," then option "0" to originate a call, then option "Q" for the IBM communications set. SMARTCOM will dial the computer and, after a carrier signal has been received, will beep and display a blank screen. The mainframe will transmit the message VM/370 ONLINE. Entering a carriage return will cause the mainframe to respond with the standard prompt of a period.

One macro has been defined for the IBM to tell the mainframe that it is not communicating in a full screen mode. All of the terminal characteristics are then displayed. The default logical escape character " (the quote mark) must be changed since SIMSCRIPT II.5 uses that character to delimit text strings. Entering "(F5)A" causes the following two lines to be transmitted:

```
CP TERMINAL LINESIZE 80 TYPE TTY ESCAPE !  
CP QUERY TERMINAL
```

To upload the data file requires entering the IBM editor, putting it into input mode, transmitting the file, then saving the mainframe file. The steps are as follows:

- a) Once connected with the IBM, transmit macro A by entering "(F5)A". If this is not done the default escape character will be " (quote marks). Consequently, the quote marks used to delimit names in the data file will be stripped off.

- b) Start the editor. A file name not already in use should be used:

```
X HK20 DATA
```

- c) Put the editor into input mode:

```
INPUT
```

- d) Enter "(F1)" to show the SMARTCOM main menu. Select option "5", Send File. The system will prompt for the transmission method:

- 1) Error Free 2) Start/Stop, 3) Send Lines

Select option "3", Send Lines. Using option "2" as for the CDC will cause transmission errors.

SMARTCOM will prompt for the file name. Enter the name as G:filename.JCL, since the HKDS stores the run streams on substitute drive G.

SMARTCOM will now transmit the file to the mainframe. The editor will accept the file as if it had been typed in using the keyboard.

- e) Turn off the input mode by entering a null line.

f) The file may now be saved:

FILE

g) The run stream file may now be executed as described in the Hunter-Killer Model User's Manual.

2.10.4 Ending a SMARTCOM Session

After a session has been completed, log off from the mainframe. Enter "(F1)" (function key 1) to return to the main menu. Select option "0" (zero), then option "E" to exit SMARTCOM.

2.11 DIRECT CONNECTION TO AN IBM MAINFRAME

2.11.1 VM/PC Setup

Direct connection with an IBM mainframe requires that the AT/370 and 3278/9 emulator boards be installed. The VM/PC (Virtual Machine / Personal Computer) software must also have been installed. The mainframe must be running under the CMS operating system.

Several preliminaries must be performed in addition to the installation of the boards and software. These need to be performed once for each user but do not need to be repeated each time a file is to be transferred to the mainframe. The VM/PC software allows the AT/370 to operate as if it were a 3278/79 terminal. Additionally, the AT/370 can function as if it were a mainframe computer running under the CMS operating system. To use the AT/370 as a terminal requires only that a user have an account on the mainframe computer. Uploading a file, however, requires operating the AT/370 in a local CMS session. This requires that the AT/370 system manager establish an account on the AT/370 for the user. This is similar to having an account established on the mainframe.

Before a file may be transferred from the AT/370 to the mainframe, the VMPCSERV software must have been uploaded to the user's mainframe account on the A disk. This should be done once and the VMPCSERV files should remain permanently on the mainframe A disk. For details on uploading the VMPCSERV software, see the IBM Virtual Machine / Personal Computer documentation.

2.11.2 IMPORTING a File

Transferring a file to the mainframe requires several steps. The HKDS produces a standard DOS file which is in ASCII. The VM/PC software, however, uses a different file structure similar to that of the mainframe and also uses EBCDIC instead of ASCII. The VM/PC software provides a command, "IMPORT", which allows the user to translate a file from ASCII to EBCDIC and copy it to the IBM mainframe. This command may also be used to copy a DOS ASCII file to a user's VM/PC local account. A related command, "EXPORT", allows a file to be moved from the mainframe to the AT/370 and translated to ASCII. For details on these commands, see the IBM Virtual Machine / Personal Computer documentation.

The procedure for transferring a data file produced by the HKDS to the IBM mainframe using VM/PC is as follows:

- a) It is first necessary to make the root directory the default, then to start the VM/PC software:

```
CD \  
VMPC
```

- b) The user will be prompted for the session type. Select type "1", Host 3279 Session.

- c) The user will now be connected to the IBM mainframe. The user should log on as if the AT/370 were a 3278/79 terminal.
- d) The user should now enter the command "VMPCSERV". This utility allows a user to communicate between a host (mainframe) and a local session. As mentioned in Section 2.11.1, this software must have first been uploaded from the AT/370 to the user's mainframe A disk.
- e) Press the "SysReq" key at the upper right hand corner of the numeric keypad.
- f) The AT/370 will again prompt for the session type. Select type "2", Local 3279 Session.
- g) Log in to the local session using the local session account name and password. The user will now have two simultaneous sessions running, host and local.
- h) The memory in the local session must be increased and CMS reinitialized. Enter:

```
DEF STOR 1M
I CMS
```

- i) The local session disks must then be linked with the mainframe disks. These commands may vary for each user. See the VM/PC documentation. The form of the commands will be:

```
LINK (account name) 191 191 MW
ACC 191 C
```

- j) The local session will now use its C disk to refer to the mainframe A disk. This is not to be confused with the C disk (fixed disk) referred to by DOS. The disk names used in a VM/PC session are meaningful only within that session.
- k) Use the "IMPORT" command to copy the HKDS data file to the mainframe. The file name used on the mainframe should not already be in use. The HKDS data file will have a name of the form "G:STREAMnn.JCL", where "nn" may be from "01" to "99". If the file on the mainframe is to be called "HK20 DATA", the command would be:

```
IMPORT G:STREAMnn.JCL HK20 DATA C (ASCII EOL
```

- l) Press the "SysReq" key again. Select session type "1" to return to the mainframe session, which is currently under the control of VMPCSERV.
- m) The VMPCSERV screen will be displayed. Press "(F3)" to end VMPCSERV and return control to CMS.
- n) The Hunter-Killer Model may now be run. See the User's Manual for details.

- o) When finished, the user must remember to log off both the host and the local sessions.

2.12 ENDING A SESSION

To end a session of the HKDS, return to the main menu. This is accomplished by entering the option "~" until the system has backed out to the main menu.

From the main menu enter the option "Q". This will cause the HKDS to close all files, delete all temporary work files, and exit back to DOS.

If a period appears as a prompt instead the DOS prompt of >C (assuming C is the default drive), the HKDS has been modified to cause it to exit to dBASE III instead of DOS. It is then necessary to enter the dBASE III command "QUIT" to exit to DOS.

2.13 ABORTING A SESSION

A user should never abort from a HKDS session unless absolutely necessary. An attempt should always be made to return to the main menu screen, at which point selecting the "Q" option causes the session to end. Aborting from the system may have unanticipated results such as leaving files open instead of closed or leaving temporary work files in existence. Data that have been entered or modified during the session may be lost.

The HKDS has been designed to function without becoming hung up (not responding to the keyboard). If this situation should occur it may be necessary to abort a session. There are two possible solutions to the problem:

- a) Enter an "Esc" (escape). On the IBM AT keyboard this is the gray key in the upper left hand corner of the numeric keypad. This may free the system, causing the Hunter-Killer Database System session to be terminated. If so, the user will be in the dBASE III system, as indicated by a period used as a prompt. Entering the command "QUIT" will cause an exit to DOS.
- b) Enter CTRL, ALT, DEL simultaneously. This is equivalent to turning the computer off then on again. It will be necessary to restart the session from the beginning.

IF THE HKDS DOES NOT FUNCTION PROPERLY, NOTIFY THE MAINTENANCE PROGRAMMER IMMEDIATELY.

2.14 DATABASE BACKUP

In order to avoid losing data if files are accidentally deleted or if the fixed disk is damaged, it is necessary to regularly backup all data files. Copies of the dBASE III software and the Hunter-Killer Database System software should be kept by the HKDS maintenance programmer and do not require regular backups. The data files should be copied whenever they are changed.

The data files are assumed to be in directory \DBASE\HKDS-20 which has the substitute drive name of H. All data files have the extension ".DBF", which is the dBASE III default extension meaning DataBase File. These are the files requiring regular backup.

There are two ways to perform a backup to a floppy diskette. First, insert a formatted diskette in a drive. Assuming drive A is used, enter the DOS command:

```
COPY H:*.DBF A:
```

This will copy all database files to the diskette in drive A. To restore the files, simply reverse the command:

```
COPY A:*.DBF H:
```

To restore a specific file:

```
COPY A:filename.DBF H:
```

The alternative command is:

```
BACKUP H:*.DBF A:
```

BACKUP has several differences from the COPY. This command causes all data already on the diskette to be lost. Secondly, it creates a special file which is a directory of the files on the diskette along with other information such as the date the backup was performed. This file allows the other files to be restored easily. The command then copies all the indicated files to the diskette. To restore all files, enter:

```
RESTORE A: H:*.DBF
```

Note that the RESTORE command must use the same file names as the BACKUP command. If the backup was performed using substitute drive H, the files must be restored to H. If the backup was performed with the directory name, \DBASE\HKDS-20, the restore command must use the directory name and not the substitute drive. This is due to the manner in which the file names are stored in the special backup directory file. As with the copy command, individual files may also be restored.

The standard way to maintain backup diskettes is to use two diskettes. The first backup is written on diskette 1, the second to diskette 2, the third to diskette 1, and so on. This allows one good copy of the files to be safe on a diskette while a second newer copy is being written to a different diskette. This is particularly important when using the BACKUP command which causes all

files already on a diskette to be lost.

For more information on the COPY, BACKUP, and RESTORE commands, refer to the IBM DOS manual.

3.0 DATABASE SCREENS

This section shows all of the screens that are displayed by the Hunter-Killer Database System. Where the screens vary from the general screen formats discussed in Section 2, descriptions of the screens are given. Each screen will also have a reference to the section where its format is discussed.

The key for the screen IDs, as defined in Section 2.1.4, is repeated here. Screen IDs are of the form d.m. The values for d are:

- 1 = Change the default drive
- 2 = Verify IDs
- 3 = Lasers Database
- 4 = Probabilities of Kill Database
- 5 = Sectors Database
- 6 = Sensors Database
- 7 = Type Platforms Database
- 8 = Type Weapons Database
- 9 = Controls Databases
- 10 = Defilade Fractions Databases
- 11 = Hunter-Killers and Move Vectors Databases
- 12 = Terrain Databases
- 13 = Run Streams

For the various databases, the values for m are:

- 0 = Select an existing database or choose to create a new one
- 1 = Create a new database
- 2 = Options menu for modifying a selected database
- 3 = Change the description of a selected database
- 4 = Delete a selected database
- 5 = Edit a selected database
- 6 = Data verification for a selected database

Not all databases will require all screens. Single version databases will only use screens d.2, d.5, and d.6.

For the databases which use the browse editor there will be no d.5 screen since the screen format is controlled by dBASE III. In place of these d.5 screens a page will appear listing all of the fields in the database and the corresponding Hunter-Killer Model variable names as follows:

DATABASE FIELD NAME = MODEL ATTRIBUTE NAME

This page may be useful when the browse editor is unable to display all fields on a single screen.

SCREEN 0.0 .

The Hunter-Killer Database System		0.0
Key Single Databases	Key Multiple Databases	
<hr/>	<hr/>	
L Lasers	C Controls	
P Probabilities of Kill	F Defilade Fractions	
S Sectors	H Hunter-Killers,	
N Sensors	Move Vectors, Air, Tactics	
K Type Platforms	T Terrain	
W Type Weapons		
or		
D Change the default drive (H:)	R Build a Run Stream	
	V Verify ID relationships	
Enter Key Letter or Q (Quit) _		

See Section 2.2.3.

SCREEN 1.0 .

The Hunter-Killer Database System	1.0
<p>Change the Default Drive</p>	
<p>Current drive is H:</p>	
<p>Enter new drive or - to cancel _</p>	
<p>WARNING: Attempting to use floppy disk drive X:. IF NO DISK is in the drive you will be asked to Abort, Retry, or Ignore. all options will force you to exit to DOS.</p>	
<p>Reenter the drive to continue or - to quit _</p>	

See Section 2.3.

SCREEN 2.0

The Hunter-Killer Database System	2.0
<p>Verify Database ID Relationships</p> <p>This procedure determines if the IDs cross-reference properly: for example, if the Type Weapon IDs in the Type Platforms database are all valid.</p> <p>Verification last performed on MM/DD/YY at HH:MM:SS</p> <p>No verification errors file exists.</p> <p>Enter E to edit the errors file D to delete the errors file P to print the errors file V to verify IDs - to return to the main menu _</p>	

See Section 2.7.

SCREEN 3.2

The Hunter-Killer Database System	3.2
<p style="text-align: center;">Lasers Database</p> <p>Enter E to edit the database R to generate a report - to return to the main menu</p> <p>NOTE: The database has more data fields than can be displayed on one screen. It will be necessary to pan right and left as shown on the help menu to edit all fields.</p> <p>The rightmost field is FALS_ALARM.</p>	

See Section 2.5.1

SCREEN 3.5 .

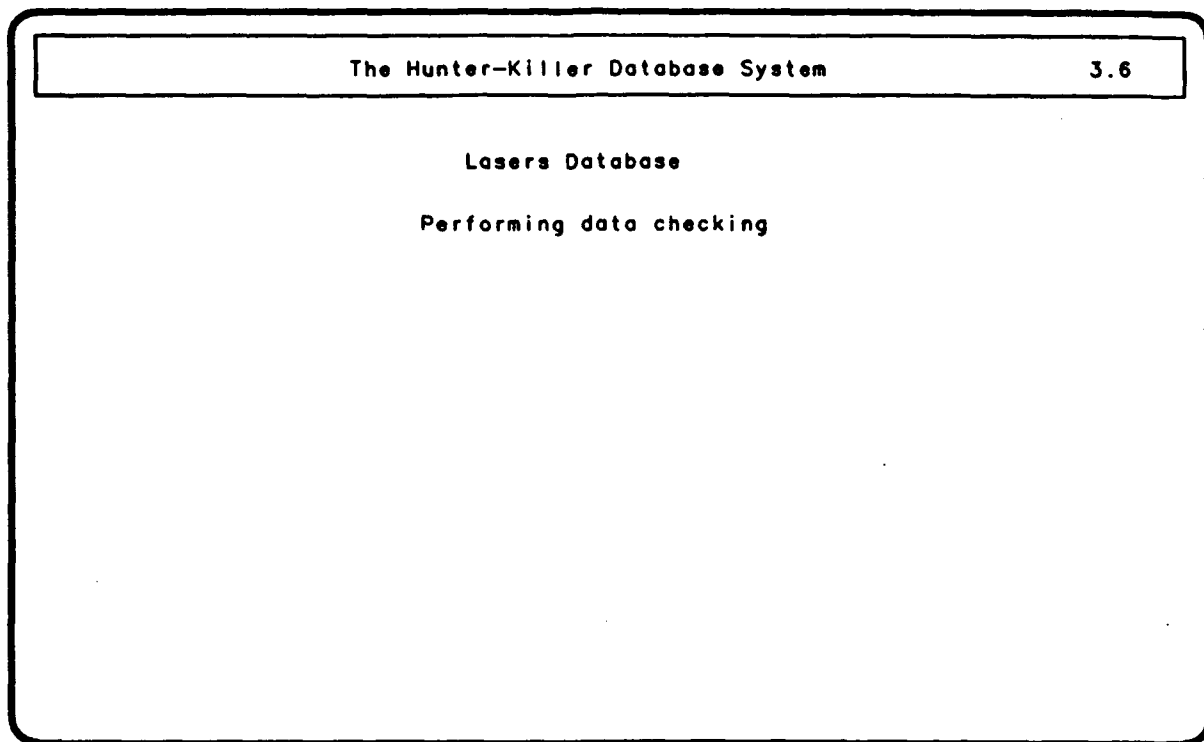
Browse editor fields for the Lasers Database.

See Section 2.6.1.

The fields in the database are as follows:

DATABASE FIELD NAME	=	MODEL ATTRIBUTE NAME
-----		-----
ID	=	LSR.ID
SPECTRUM	=	LSR.SPECTRUM
PEAK POWER	=	LSR.PEAK.PWR
OPTIC_XMIS	=	LSR.OPTICS.XMISS
BEAM_DIVER	=	LSR.BEAM.DIVERGENCE
REC_APERAT	=	LSR.RCVR.APERATURE
NOISE_EQ_P	=	LSR.NOISE.EQUIV.PWR
PULSE_WIDT	=	LSR.PULSE.WIDTH
FALS_ALARM	=	LSR.FALS_ALARM

SCREEN 3.6 .



See Section 2.5.2

SCREEN 4.2 .

<div data-bbox="583 357 1087 392" data-label="Text"><p>The Hunter-Killer Database System</p></div> <div data-bbox="1338 361 1400 392" data-label="Text"><p>4.2</p></div>
--

Probability of Kill Combinations

Enter E to edit the database
R to generate a report
- to return to the main menu

See Section 2.5.1.

SCREEN 4.21 .

The Hunter-Killer Database System										4.21
Probability of Kill Combinations										
Weapon		vs Type Platform			Weapon		vs Type Platform			
ID	NAME	ID	NAME	Errors	ID	NAME	ID	NAME	Errors	
Edit/Create/Delete/+ (show more)/- (return) _ Enter the weapon ID ___ and the type platform ID ___										

This screen is displayed when option "E" is selected from Screen 4.2. The database is built using weapon and type platform IDs. When Screen 4.21 is displayed, the HKDS attempts to look up the corresponding names from the Type Weapons and Type Platforms Databases. If an ID does not appear in the appropriate database, "Undefined" will be displayed in the "NAME" column.

This screen allows editing of the probabilities of kill for specific weapon/target combinations. The options are:

- E = edit one of the displayed combinations
- C = create a new combination
- D = delete one of the displayed combinations
- + = show more combinations - the screen can display up to 20 at a time
- = return to the previous screen, Screen 4.2

If option "E", "C", or "D" is chosen, the user will be prompted for a Type Weapon ID and a Type Platform ID. If option "E" is chosen, the browse editor will be entered to edit the database. The fields are shown on Screen 4.5.

An entry will appear in the "Errors" column if the Type Platform ID is for a targeted platform with a Johnson Level less than 4. Probabilities of Kill are only meaningful for level 4 type platforms. The error will read "Level = n", where n is the targeted type platform's Johnson Level.

SCREEN 4.5 .

Browse editor fields for the Probabilities of Kill Database.

See Section 2.6.1.

The fields in the database are as follows:

DATABASE FIELD NAME	=	MODEL ATTRIBUTE NAME
-----		-----
RANGE	=	PK.DISTANCE
RANGD_PD	=	PK.RANGED.VALUE
UNRANGD_PK	=	PK.UNRANGED.VALUE

SCREEN 4.6.

The Hunter-Killer Database System	4.6
Probability of Kill Combinations	
Performing data checking	

See Section 2.5.2

SCREEN 5.2 .

The Hunter-Killer Database System	5.2
-----------------------------------	-----

Sectors Database

Enter E to edit the database
R to generate a report
- to return to the main menu

See Section 2.5.1.

SCREEN 5.5 .

Browse editor fields for the Sectors Database.

See Section 2.6.1.

The fields in the database are as follows:

DATABASE FIELD NAME	=	MODEL ATTRIBUTE NAME
-----		-----
ID	=	SC.ID
HORZ_FOS	=	SC.HORZ.FOS
VERT_FOS	=	SC.VERT.FOS

SCREEN 5.6

The Hunter-Killer Database System	5.6
<p>Sectors Database</p> <p>Performing data checking</p>	

See Section 2.5.2.

SCREEN 6.2 .

The Hunter-Killer Database System		6.2
Sensors Database		
Enter E to edit the database	D to edit the resolution curves	
R to generate a report	G to generate a resolution curve report	
- to return to the main menu		
 NOTE: The database has more data fields than can be displayed on one screen. It will be necessary to pan right and left as shown on the help menu to edit all fields.		
 The rightmost field is ATR_ID.		

See Section 2.5.1.

This screen includes two additional options. Each sensor may have several resolution curves. A MRC sensor may have up to four curves: two each for narrow FOV and for wide FOV, each curve being for a different light level. A MRT sensor may have up to three curves: for narrow FOV, for wide FOV, and for MDT acquisitions. In addition, an MRT sensor used in an ATR system may have a separate curve for the automatic mode.

The curves are maintained in a separate database that may be edited by selecting option "D" from this screen. The sensors reference these curves through ID numbers. The database is organized by increasing curve ID. Selecting option "G" will cause a report on the curves to be sent to the printer. The attributes of the curves are shown on the page for Screen 6.5.

SCREEN 6.5 .

Browse editor fields for the Sensors Database and the Resolution Curves Database.

See Section 2.6.1.

The fields in the Sensors Database are as follows:

DATABASE FIELD NAME	=	MODEL ATTRIBUTE NAME
-----		-----
ID	=	SN.ID
SPECTRUM	=	SN.SPECTRUM
HORZ_WFOV	=	SN.HORZ.WFOV
VERT_WFOV	=	SN.VERT.WFOV
FOV_SCAL	=	SN.FOV.SCALING
SWITCH_DEL	=	SN.SWITCH.FOV.DELAY
SN_FACTOR	=	SN.SN.FACTOR
POT_FACTOR	=	SN.POT.FACTOR
NFOV_ID	=	ID of a resolution curve
NFOV_2_ID	=	ID of a resolution curve
WFOV_ID	=	ID of a resolution curve
WFOV_2_ID	=	ID of a resolution curve
MDT_ID	=	ID of a resolution curve
ATR_ID	=	ID of a resolution curve

The curve IDs should be set to zero for curves not used by the sensor.

The fields in the Sensor Curves Database are as follows:

DATABASE FIELD NAME	=	MODEL ATTRIBUTE NAME
-----		-----
CURVE_ID	=	ID used for NFOV_ID, NFOV_2_ID, WFOV_ID, WFOV_2_ID, MDT_ID, AND ATR_ID to reference a specific curve
CURVE_TYPE	=	RC.RESOLUTION.TYPE
LIGHT_LEVEL	=	RC.LIGHT.LEVEL
X_1	=	FP.X.POINT
Y_1	=	FP.Y.POINT
X_2	=	FP.X.POINT
Y_2	=	FP.Y.POINT
X_3	=	FP.X.POINT
Y_3	=	FP.Y.POINT
...		
X_20	=	FP.X.POINT
Y_20	=	FP.Y.POINT

SCREEN 6.6

<div data-bbox="586 340 1085 378" data-label="Text"><p>The Hunter-Killer Database System</p></div> <div data-bbox="1333 342 1395 376" data-label="Text"><p>6.6</p></div>
<div data-bbox="705 436 954 470" data-label="Text"><p>Sensors Database</p></div> <div data-bbox="659 497 1027 534" data-label="Text"><p>Performing data checking</p></div>

See Section 2.5.2.

SCREEN 7.2.

The Hunter-Killer Database System	7.2
<p style="text-align: center;">Type Platforms Database</p> <p>Enter E to edit the database R to generate a report - to return to the main menu</p> <p>NOTE: The database has more data fields than can be displayed on one screen. It will be necessary to pan right and left as shown on the help menu to edit all fields.</p> <p>The rightmost field is CONTRAST.</p>	

See Section 2.5.1.

SCREEN 7.5 .

Browse editor fields for the Type Platforms Database.

See Section 2.6.1.

The fields in the database are as follows:

DATABASE FIELD NAME	=	MODEL ATTRIBUTE NAME
-----		-----
ID	=	TP.ID
NAME	=	TP.NAME
JOHN LEVEL	=	TP.LEVEL
OWNER_ID	=	TP.OWNER
COLOR	=	TP.COLOR
PRIORITY	=	TP.PRIORITY
WEAPON_ID	=	TP.TYPE.WPN.PTR
CLASS	=	TP.CLASS.PTR
HEIGHT	=	TP.HEIGHT
X SECTION	=	TP.CROSS.SECTION
DELTA T	=	TP.DELTA.T
REFLECTANC	=	TP.REFLECTANCE
CONTRAST	=	TP.CONTRAST

SCREEN 7.6.

The Hunter-Killer Database System	7.6
<p data-bbox="660 453 1009 487">Type Platforms Database</p> <p data-bbox="650 514 1009 549">Performing data checking</p>	

See Section 2.5.2.

SCREEN 8.2.

The Hunter-Killer Database System	8.2
-----------------------------------	-----

Type Weapons Database

Enter E to edit the database
R to generate a report
- to return to the main menu

See Section 2.5.1.

SCREEN 8.5 .

Browse editor fields for the Type Weapons Database.

See Section 2.6.1.

The fields in the database are as follows:

DATABASE FIELD NAME	=	MODEL ATTRIBUTE NAME
-----		-----
ID	=	TW.ID
NAME	=	TW.NAME
DESIGNATOR	=	TW.DESIGNATOR
SPEED	=	TW.SPEED
RELOAD_TIM	=	TW.RELOAD.TIME

SCREEN 8.6

The Hunter-Killer Database System	8.6
Type Weapons Database	
Performing data checking	

See Section 2.5.2.

SCREEN 9.0.

The Hunter-Killer Database System		9.0
Controls Databases		
01	Visibility = 1000; Low Resolution Terrain; No Defilade	
02	Visibility = 2000; High Resolution Terrain; Defilade	
Enter ID of database to be modified		
C to create a new database		
+ to display more database names (if there are more than 10)		
- to return to the main menu _		

See Section 2.4.1.

SCREEN 9.1.

The Hunter-Killer Database System	9.1
<p>Controls Databases</p>	
<p>New database to be created has ID 03</p>	
<p>Enter file description, up to 60 characters:</p> <p>_____</p>	
<p>Start new file or Copy Existing File (N/C)? _</p>	
<p>Enter ID of database to be copied or</p>	
<p>- to cancel _</p>	

See Section 2.4.2.

SCREEN 9.2 .

The Hunter-Killer Database System	9.2
CONTROLS 01: Visibility = 1000; Low Resolution Terrain; No Defilade	
<p>Enter E to edit the database D to delete the database C to change the comment field R to generate a report - to return to the previous screen _</p>	

See Section 2.4.3.

SCREEN 9.3 .

The Hunter-Killer Database System	9.3
<p>CONTROLS 01: Visibility = 1000; Low Resolution Terrain; No Defilade</p> <p>Comment field to be changed for database ID 01</p> <p>Comments: Visibility = 1000; Low Resolution Terrain; No Defilade</p> <p>Enter confirmation (Y/N) _</p>	

See Section 2.4.4.

SCREEN 9.4

The Hunter-Killer Database System	9.4
CONTROLS 01: Visibility = 1000; Low Resolution Terrain; No Defilade	
Ready to delete the following database	
Database ID: 01	
Comments: Visibility = 1000; Low Resolution Terrain; No Defilade	
Enter confirmation (Y/N) _	

See Section 2.4.5.

SCREEN 9.51 .

The Hunter-Killer Database System		9.51
CONTROLS 01: Visibility = 1000; Low Resolution Terrain; No Defilade		
RUN CONTROLS		
Number of Replications	__	
Replication Length	---	minutes
Targets in Defilade	-	No / Yes
Defilade database ID	__	(only used when Targets in Defilade is Yes)
Terrain Resolution	-	Low / High
Terrain database ID	__	(used if Terrain Resolution is Low)
Mainframe Terrain File	_____	(used if Terrain Resolution is High)
Smoke Switch	-	No / Yes
Fixed Azimuth	-	No / Yes
_ Continue to next screen (Y/N)?		

See Section 2.6.2.

SCREEN 9.52 .

The Hunter-Killer Database System		9.52
CONTROLS 01: Visibility = 1000; Low Resolution Terrain; No Defilade		
OUTPUT CONTROLS		
Echo the Data	-	No / Yes
Report Each Replication	-	No / Yes (Produce Initial LOS Report, Scoreboard and Sensor Performance Report after each replication)
Produce Status Reports	-	0-4 (0 = no status reports 1 = report only at replication start 2 = start + every report interval 3 = start + interval + every kill 4 = start + every kill)
Report Interval	--	minutes
Produce General Trace	-	No / Yes
Produce Search Trace	-	No / Yes
Produce Terrain Trace	-	No / Yes
Continue to next screen (Y/N)?		

See Section 2.5.2.

SCREEN 9.53

The Hunter-Killer Database System

9.53

CONTROLS 01: Visibility = 1000; Low Resolution Terrain; No Defilade

SEARCH CONTROLS

Visibility _____ meters
Minimum Detection Time _____ seconds
Light Level _____ foot-candles
Probability of Successful Battlefield Identification, Friend or Foe
 Blue Probability _____ (0.00 means BIFF will not be played)
 Red Probability _____
Sky to ground Ratios for sensors operating at:
 .4 to .7 microns _____
 .4 to .9 microns _____
 .6 to .9 microns _____
Absorption Coefficients for sensors operating at:
 3 to 5 microns _____
 8 to 12 microns _____

_ Continue to next screen (Y/N)?

See Section 2.6.2.

SCREEN 9.54 .

The Hunter-Killer Database System		9.54																																	
<p>CONTROLS 01: Visibility = 1000; Low Resolution Terrain; No Defilade</p> <p>Johnson Criteria - N50 Bars</p> <table style="margin-left: auto; margin-right: auto;"><thead><tr><th></th><th style="text-align: center;">Contrast</th><th style="text-align: center;">Thermal</th></tr></thead><tbody><tr><td>Detection</td><td style="text-align: center;">---.</td><td style="text-align: center;">---.</td></tr><tr><td>Classification</td><td style="text-align: center;">---.</td><td style="text-align: center;">---.</td></tr><tr><td>Recognition</td><td style="text-align: center;">---.</td><td style="text-align: center;">---.</td></tr><tr><td>Identification</td><td style="text-align: center;">---.</td><td style="text-align: center;">---.</td></tr></tbody></table> <p style="text-align: center; margin-top: 20px;">PGM DEGRADATION CURVE</p> <table style="margin-left: auto; margin-right: auto;"><thead><tr><th></th><th style="text-align: center;">Range (Meters)</th><th style="text-align: center;">Reduction Factor</th></tr></thead><tbody><tr><td>Point 1</td><td style="text-align: center;">-----</td><td style="text-align: center;">---.</td></tr><tr><td>Point 2</td><td style="text-align: center;">-----</td><td style="text-align: center;">---.</td></tr><tr><td>Point 3</td><td style="text-align: center;">-----</td><td style="text-align: center;">---.</td></tr><tr><td>Point 4</td><td style="text-align: center;">-----</td><td style="text-align: center;">---.</td></tr><tr><td>Point 5</td><td style="text-align: center;">-----</td><td style="text-align: center;">---.</td></tr></tbody></table> <p style="margin-top: 20px;">_ Continue to next screen (Y/N)?</p>				Contrast	Thermal	Detection	---.	---.	Classification	---.	---.	Recognition	---.	---.	Identification	---.	---.		Range (Meters)	Reduction Factor	Point 1	-----	---.	Point 2	-----	---.	Point 3	-----	---.	Point 4	-----	---.	Point 5	-----	---.
	Contrast	Thermal																																	
Detection	---.	---.																																	
Classification	---.	---.																																	
Recognition	---.	---.																																	
Identification	---.	---.																																	
	Range (Meters)	Reduction Factor																																	
Point 1	-----	---.																																	
Point 2	-----	---.																																	
Point 3	-----	---.																																	
Point 4	-----	---.																																	
Point 5	-----	---.																																	

See Section 2.6.2.

SCREEN 10.0 .

The Hunter-Killer Database System		10.0
Defilade Fractions Visible Databases		
01	Low, rolling terrain	
02	Moderately hilly terrain	
Enter ID of database to be modified		
C	to create a new database	
+	to display more database names (if there are more than 10)	
-	to return to the main menu --	

See Section 2.4.1.

SCREEN 10.1

The Hunter-Killer Database System	10.1
-----------------------------------	------

Defilade Fractions Visible Databases

New database to be created has ID 03
Enter file description, up to 60 characters:

Start new file or Copy Existing File (N/C)? _

Enter ID of database to be copied or
- to cancel --

See Section 2.4.2.

SCREEN 10.2

The Hunter-Killer Database System	10.2
-----------------------------------	------

DEFILADE 01: Low, Rolling Terrain

Enter E to edit the database
D to delete the database
C to change the comment field
R to generate a report
- to return to the previous screen _

See Section 2.4.3.

SCREEN 10.21

The Hunter-Killer Database System				10.21			
DEFILADE 01: Low, rolling terrain							
Observer vs CLASS	Type Platform ID	NAME	ERRORS	Observer vs CLASS	Type Platform ID	NAME	ERRORS
<p>Fractions for Type Platform ID = 0 (if defined) used for unspecified targets</p> <p>Edit/Create/Delete/+ (show more)/- (return) _</p>							

This screen is displayed when option "E" is selected from Screen 10.2. The database is built using observer classes, Air or Ground, and type platform IDs. When Screen 10.21 is displayed, the HKDS attempts to look up the corresponding names from the Type Platforms Database. If an ID does not appear in the database, "Undefined" will be displayed in the "NAME" column.

This screen allows editing of the defilade fractions visible for specific observer class/target combinations. The options are:

- E = edit one of the displayed combinations
- C = create a new combination
- D = delete one of the displayed combinations
- + = show more combinations - the screen can display up to 20 at a time
- = return to the previous screen, Screen 10.2

If option "E", "C", or "D" is chosen, the user will be prompted for a class and a Type Platform ID. If option "E" is chosen, the browse editor will be entered to edit the database. The fields are shown on Screen 10.5.

A special type platform ID of 0 (zero) may be entered. The fractions entered for in this case will be used when a run stream is generated for all targets that do not explicitly appear in the database. The name "General" will appear on the display.

There are two possible entries that may appear in the "Errors" column. These are:

LEVEL=n The type platform has a Johnson Level less than 4, indicated by n. Defilade Fractions are only meaningful for level 4 type platforms.

Air Target The type platform has a class of air. Defilade fractions are only meaningful against ground targets. Air targets are either masked - 0% visible - or unmasked - 100% visible.

SCREEN 10.3

The Hunter-Killer Database System	10.3
DEFILADE 01: Low, rolling terrain	
Comment field to be changed for database ID 01	
Comments: Low, rolling terrain	
Enter confirmation (Y/N) _	

See Section 2.4.4

SCREEN 10.4

The Hunter-Killer Database System	10.4
DEFILADE 01: Low, rolling terrain	
Ready to delete the following database	
Database ID: 01	
Comments: Low, rolling terrain	
Enter confirmation (Y/N) _	

See Section 2.4.5.

SCREEN 10.5 .

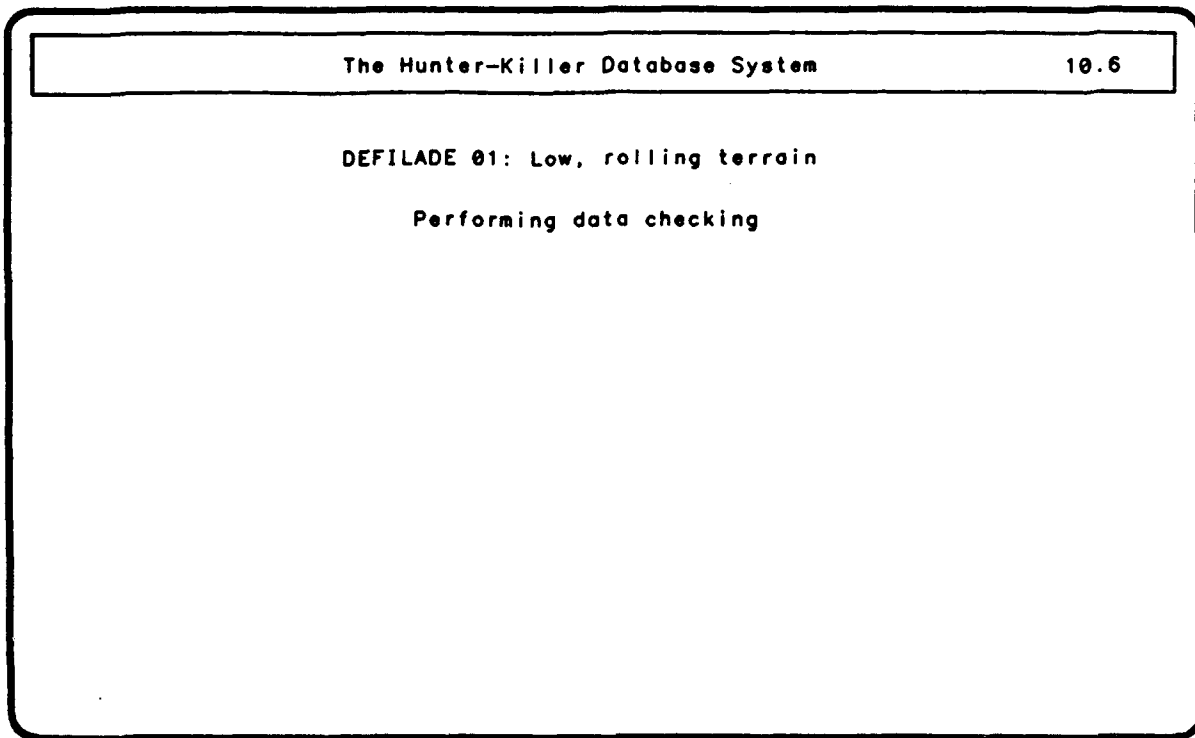
Browse editor fields for a Defilade Fractions Visible Database.

See Section 2.6.1.

The fields in the database are as follows:

DATABASE FIELD NAME	=	MODEL ATTRIBUTE NAME
-----		-----
RANGE	=	FV.RANGE
FRAC_VIS	=	FV.FRACTION

SCREEN 10.6



See Section 2.4.7.

SCREEN 11.0 .

The Hunter-Killer Database System		11.0
Hunter-Killer Databases		
01	4 blue XM1 vs 13 red T72	
02	4 blue XM1 + 2 helicopters vs 13 red T72	
Enter ID of database to be modified		
	C to create a new database	
	+ to display more database names (if there are more than 10)	
	- to return to the main menu —	

See Section 2.4.1.

SCREEN 11.1 .

The Hunter-Killer Database System	11.1
-----------------------------------	------

Hunter-Killer Databases

New database to be created has ID 03
Enter file description, up to 60 characters:

Start new file or Copy Existing File (N/C)? _

Enter ID of database to be copied or
- to cancel _

See Section 2.4.2.

SCREEN 11.2.

The Hunter-Killer Database System		11.2
HKS 01: 4 blue XM1 vs 13 red T72		
Enter E to edit	the database	M to modify move vectors
D to delete	the database	A to modify the air tactics
C to change	the comment field	
R to generate	a report	
-	to return to the previous screen	_
 NOTE: The Hunter-Killers database has more fields than can be displayed on one screen. It will be necessary to pan right and left as shown on the help menu to edit all fields.		
The rightmost field is K_JOHN_LEVEL.		

See Section 2.4.3.

This screen has two additional options, "M" and "A". Option M causes the move vectors for the hunter-killers to be edited. Screens 11.51 and 11.52 are displayed. Option A causes the air tactics to be edited. Screen 11.53 is displayed.

SCREEN 11.3 .

The Hunter-Killer Database System	11.3
HKS 01: 4 blue XM1 vs 13 red T72	
Comment field to be changed for database ID 01	
Comments: 4 blue XM1 vs 13 red T72	
Enter confirmation (Y/N) _	

See Section 2.4.4.

SCREEN 11.3

The Hunter-Killer Database System	11.3
HKS 01: 4 blue XM1 vs 13 red T72	
Comment field to be changed for database ID 01	
Comments: 4 blue XM1 vs 13 red T72	
Enter confirmation (Y/N) _	

See Section 2.4.4.

SCREEN 11.5 .

Browse editor fields for a Hunter-Killers Database.

See Section 2.6.1.

The fields in the database are as follows:

DATABASE FIELD NAME	=	MODEL ATTRIBUTE NAME
-----		-----
ID	=	HK.ID
SIDE	=	HK.SIDE
T_PLAT_ID	=	HK.TYPE.PLATFORM.PTR
X_COORD	=	HK.X.LOCATION
Y_COORD	=	HK.Y.LOCATION
H_SENSOR	=	CM.SENSOR(HK.HUNTER.COMPONENT)
H_LASER	=	CM.LASER(HK.HUNTER.COMPONENT)
H_SECTOR	=	CM.SECTOR(HK.HUNTER.COMPONENT)
H_AZIMUTH	=	CM.AZIMUTH(HK.HUNTER.COMPONENT)
H_JOHN_LEV	=	CM.LEVEL(HK.HUNTER.COMPONENT)
K_SENSOR	=	CM.SENSOR(HK.KILLER.COMPONENT)
K_LASER	=	CM.LASER(HK.KILLER.COMPONENT)
K_SECTOR	=	CM.SECTOR(HK.KILLER.COMPONENT)
K_AZIMUTH	=	CM.AZIMUTH(HK.KILLER.COMPONENT)
K_JOHN_LEV	=	CM.LEVEL(HK.KILLER.COMPONENT)

SCREEN 11.51.

The Hunter-Killer Database System	11.51
HKS 01: 4 blue XM1 vs 13 red T72	
Movement Controls	
The movement interval is the distance a platform moves each time its coordinates are updated:	
Interval ___ meters	
_ Continue to next screen (Y/N)?	

See Section 2.5.2.

SCREEN 11.52.

The Hunter-Killer Database System

11.52

HKS 01: 4 blue XM1 vs 13 red T72

Movement Vectors

The movement vectors are ordered first by increasing Hunter-Killer ID. The vectors for each Hunter-Killers are ordered by increasing sequence number. New vectors are added to the end of the file and are then automatically put in their proper positions. Changing a Hunter-Killer ID within the file or changing a vector sequence number will cause the file to be reordered.

If Hunter-Killers are deleted from a Hunter-Killer database or if their ID numbers are changed, the movement vector file must also be updated. CHANGING A HUNTER-KILLER DATABASE DOES NOT AUTOMATICALLY CHANGE THE ASSOCIATED MOVE VECTOR FILE.

After editing the movement vectors a check will be made to ensure that all Hunter-Killer IDs match those in the associated Hunter-Killer database.

Edit the movement vectors (Y/N)? _

This screen describes the Move Vectors Database. It allows the user to skip the editing of the database by entering "N" in response to the prompt.

If the user enters "Y", the browse editor will be entered. The fields displayed are:

DATABASE FIELD NAME	=	MODEL ATTRIBUTE NAME
HK_ID	=	the ID of the hunter-killer using this vector
SEQUENCE	=	a sequence number used to order the vectors belonging to HK_ID
AZIMUTH	=	MV.AZIMUTH
SPEED	=	MV.SPEED
ALTITUDE	=	MV.ALTITUDE
DISTANCE	=	MV.DISTANCE
GO_TO_SEQ	=	The SEQUENCE number of the next vector in a closed loop

SCREEN 11.53.

The Hunter-Killer Database System		11.53
HKS 01: 4 blue XM1 vs 13 red T72		
Air Tactics		
<p>The following values control the amount of time a flight team is masked when using POPUP tactics</p> <p>Masked time between rounds ___ seconds</p> <p>Minimum unmasked time to acquire targets ___ seconds</p> <p>Maximum unmasked time for an ATR sensor ___ seconds</p> <p>ATR sensor target recognition time ___ seconds</p> <p>The database allows for two flight teams (the model allows any number). The tactics that may be used are: FIXED, POPUP, ATR, and ATRMMW.</p>		
SCOUT	MOVE	
TEAM	PLATFORM	TACTICS INTERVAL ATTACK PLATFORM IDS
1	___	_____ ___ ___ ___ ___
2	___	_____ ___ ___ ___ ___
_ Continue to next screen (Y/N)?		

This screen allows the air tactics to be set for a Hunter-Killer Database.

SCREEN 11.61

The Hunter-Killer Database System	11.61
-----------------------------------	-------

HKS 01: 4 blue XM1 vs 13 red T72

Performing data checking on the Hunter-Killers

See Section 2.4.7. This screen is displayed after the "E" option from Screen 11.2 has been used to modify a Hunter-Killers Database.

SCREEN 11.62.

The Hunter-Killer Database System	11.62
HKS 01: 4 blue XM1 vs 13 red T72	
Performing data checking on the Move Vectors	

See Section 2.4.7. This screen is displayed after the "M" option from Screen 11.2 has been used to modify a Move Vectors Database.

SCREEN 11.63 .

The Hunter-Killer Database System	11.63
-----------------------------------	-------

HKS 01: 4 blue XM1 vs 13 red T72

Performing data checking on the Air Tactics

See Section 2.4.7. This screen is displayed after the "A" option from Screen 11.2 has been used to modify an Air Tactics Database.

SCREEN 12.0

The Hunter-Killer Database System	12.0
<p>Terrain Databases</p> <p>01 Low, rolling terrain 02 Moderately hilly terrain</p> <p>Enter ID of database to be modified C to create a new database + to display more database names (if there are more than 10) - to return to the main menu —</p>	

See Section 2.4.1.

SCREEN 12.1

The Hunter-Killer Database System	12.1
<p>Terrain Databases</p> <p>New database to be created has ID 03 Enter file description, up to 60 characters:</p> <p>-----</p> <p>Start new file or Copy Existing File (N/C)? _</p> <p>Enter ID of database to be copied or - to cancel _</p>	

See Section 2.4.2.

SCREEN 12.2

The Hunter-Killer Database System	12.2
TERRAIN 01: Low, rolling terrain	
Enter E to edit the database	
D to delete the database	
C to change the comment field	
R to generate a report	
- to return to the previous screen _	

See Section 2.4.3.

SCREEN 12.3 .

The Hunter-Killer Database System	12.3
TERRAIN 01: Low, rolling terrain	
Comment field to be changed for database ID 01	
Comments: Low, rolling terrain	
Enter confirmation (Y/N) _	

See Section 2.4.4.

SCREEN 12.4

The Hunter-Killer Database System	12.4
TERRAIN 01: Low, rolling terrain	
Ready to delete the following database	
Database ID: 01	
Comments: Low, rolling terrain	
Enter confirmation (Y/N) _	

See Section 2.4.5.

SCREEN 12.51

The Hunter-Killer Database System

12.51

TERRAIN 01: Low, rolling terrain

These data are only used for low resolution terrain.

Define the mean times in seconds that line of sight will exist and will be broken between a pair of Hunter-Killers:

mu - LOS exists ____

mu - LOS is broken ____

_ Continue to next screen (Y/N)?

See Section 2.5.1.

SCREEN 12.52

The Hunter-Killer Database System	12.52
<p>TERRAIN 01: Low, rolling terrain</p> <p>Initial Line of Sight Curve</p> <p>Enter the initial line of sight curve used to determine whether LOS exists between pairs of ground Hunter-Killers at the start of each replication. The curve gives the probability of LOS at a given range in meters.</p> <p>Edit the LOS curve (Y/N)? _</p>	

This screen describes the Probability of Line of Sight Database. The user may skip the database by entering "N" in response to the prompt.

If the user enters "Y", the browse editor will be entered. The fields displayed are:

DATABASE		
FIELD NAME	=	MODEL ATTRIBUTE NAME
-----		-----
RANGE	=	LOS.DISTANCE
PROB_LOS	=	LOS.PROBABILITY

SCREEN 12.6

The Hunter-Killer Database System	12.6
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TERRAIN 01: Low, rolling terrain

Performing data checking

See Section 2.4.7.

SCREEN 13.0

The Hunter-Killer Database System	13.0
<p>Run Streams Databases</p> <p>01 Standard run</p> <p>Enter ID of database to be modified</p> <ul style="list-style-type: none">C to create a new database+ to display more database names (if there are more than 10)- to return to the main menu --	

See Section 2.4.1.

SCREEN 13.1

The Hunter-Killer Database System	13.1
Run Streams Databases	
<p>New database to be created has ID 03 Enter file description, up to 60 characters:</p> <p>-----</p>	
<p>Start new file or Copy Existing File (N/C)? _</p>	
<p>Enter ID of database to be copied or - to cancel --</p>	

See Section 2.4.2.

SCREEN 13.2

The Hunter-Killer Database System		13.2
STREAMS 01: Standard Run		
Enter E to edit the database B to build the run stream		
D to delete the database F to edit the run stream error file		
C to change the comment field L to print the run stream file		
R to generate a report P to print the run stream error file		
X to delete the run stream & error files		
- to return to the previous screen _		
Note: the run stream file is too large to be edited from within dBASE III		

See Section 2.9.1.

SCREEN 13.3

The Hunter-Killer Database System	13.3
STREAMS 01: Standard Run	
Comment field to be changed for database ID 01	
Comments: Standard Run	
Enter confirmation (Y/N) _	

See Section 2.4.4.

SCREEN 13.4

The Hunter-Killer Database System	13.4
-----------------------------------	------

STREAMS 01: Standard Run

Ready to delete the following database

Database ID: 01
Comments: Standard Run

Enter confirmation (Y/N) _

See Section 2.4.5.

SCREEN 13.51

The Hunter-Killer Database System	13.51
-----------------------------------	-------

STREAMS 01: Standard Run

Last run usage - Run stream generated MM/DD/YY at HH:MM:SS

Enter a run description. The first line will appear as a header on each page of output. All four lines will appear on the first page of output.

Choose the databases to be used:

Controls __

Hunter-Killers __

_ Continue to next screen (Y/N)?

See Section 2.9.2.

SCREEN 13.52

The Hunter-Killer Database System	13.52																				
<p>STREAMS 01: Standard Run</p> <p>To override the visibility in the controls database, enter a value:</p> <p>New Visibility _____ meters</p> <p>To override the sensors or lasers in the Hunter-Killers database:</p> <table style="margin: 10px auto; border: none;"><thead><tr><th></th><th colspan="2" style="text-align: center;">BLUE</th><th colspan="2" style="text-align: center;">RED</th></tr><tr><th></th><th style="text-align: center;">Hunter</th><th style="text-align: center;">Killer</th><th style="text-align: center;">Hunter</th><th style="text-align: center;">Killer</th></tr></thead><tbody><tr><td>Sensor ID</td><td style="text-align: center;">---</td><td style="text-align: center;">---</td><td style="text-align: center;">---</td><td style="text-align: center;">---</td></tr><tr><td>Laser ID</td><td style="text-align: center;">---</td><td style="text-align: center;">---</td><td style="text-align: center;">---</td><td style="text-align: center;">---</td></tr></tbody></table> <p>Continue to next screen (Y/N)?</p>			BLUE		RED			Hunter	Killer	Hunter	Killer	Sensor ID	---	---	---	---	Laser ID	---	---	---	---
	BLUE		RED																		
	Hunter	Killer	Hunter	Killer																	
Sensor ID	---	---	---	---																	
Laser ID	---	---	---	---																	

See Section 2.9.2.

SCREEN 13.7

The Hunter-Killer Database System	13.7
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STREAMS 01: Standard Run

Building a run stream for the CDC mainframe

Run Description:
Line 1 will appear at the top of each page of Hunter-Killer Model output.
Lines 2 through 4, if not blank,
will also appear
on the first page of output.

Database IDs:
Controls ____
Hunter-Killers ____

Enter user name with no embedded blanks (for task card) _____
Enter account on which the load module is stored _____
Enter account to which the output is to be cataloged _____

See Section 2.9.3.

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APPENDIX A - REFERENCES

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APPENDIX B - SAMPLE REPORTS

This appendix contains sample reports for each of the databases. The data shown are intended to describe a realistic scenario with realistic performance values (such as probabilities of kill), but should not be used for a study without being verified elsewhere.

The reports are given in the following order:

- Lasers
- Probabilities of Kill
- Sectors
- Sensors
- Sensor Resolution Curves
- Type Platforms
- Type Weapons
- Controls
- Defilade Fractions
- Hunter-Killers
- Air Tactics
- Movement Controls
- Movement Vectors
- Terrain
- Run Streams

Both the Sensors and the Sensor Resolution Curves reports are produced from the sensors menu (option N from the main menu). The Hunter-Killers, Movement Controls, Movement Vectors, and Air Tactics reports are all produced from the Hunter-Killers menu (option H from the main menu).

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LASERS DATABASE

ID	SPECTRUM	PEAK POWER (WATTS)	OPTICS TRANSMISSION	BEAM DIVERGENCE (MRAD)	RECEIVER APERATURE (MM)	NOISE EQUIVALENT POWER	PULSE WIDTH (NANOSEC)	FALSE ALARM RATE (NUM/SEC)
1	10.6	2200000	0.72	0.50	56.40	2.90	60	0.01
2	10.6	5000000	0.60	0.50	70.00	5.00	8	0.01

The Hunter-Killer Database System

PROBABILITIES OF KILL DATABASE

Weapon ID 100 M1 GUN
 RANGE (KM) 0
 RANGED PK 0.90
 UNRANGED PK 0.80

Weapon ID 100 M1 GUN
 RANGE (KM) 0
 RANGED PK 0.90
 UNRANGED PK 0.80

Weapon ID 110 TOW
 RANGE (KM) 0
 RANGED PK 0.85
 UNRANGED PK 0.85

Weapon ID 110 TOW
 RANGE (KM) 0
 RANGED PK 0.85
 UNRANGED PK 0.85

Weapon ID 120 HELLFIRE
 RANGE (KM) 0
 RANGED PK 0.85
 UNRANGED PK 0.85

Weapon ID 120 HELLFIRE
 RANGE (KM) 0
 RANGED PK 0.85
 UNRANGED PK 0.85

Weapon ID 130 COPPERHEAD
 RANGE (KM) 0
 RANGED PK 0.85
 UNRANGED PK 0.85

Weapon ID 130 COPPERHEAD
 RANGE (KM) 0
 RANGED PK 0.85
 UNRANGED PK 0.85

Weapon ID 200 T72 GUN
 RANGE (KM) 0
 RANGED PK 0.00
 UNRANGED PK 0.80

Weapon ID 210 HEATSEEKER
 RANGE (KM) 0
 RANGED PK 0.00
 UNRANGED PK 0.50

versus Type Platform ID 200 T72
 500 1000 1500 2000 2500 2510
 0.86 0.67 0.46 0.30 0.19 0.00
 0.61 0.41 0.22 0.10 0.05 0.00

versus Type Platform ID 201 LAUNCHER
 500 1000 1500 2000 2500 2510
 0.86 0.67 0.46 0.30 0.19 0.00
 0.61 0.41 0.22 0.10 0.05 0.00

versus Type Platform ID 200 T72
 4000 4020
 0.75 0.00
 0.75 0.00

versus Type Platform ID 201 LAUNCHER
 4000 4020
 0.80 0.00
 0.80 0.00

versus Type Platform ID 200 T72
 4000 4020
 0.75 0.00
 0.75 0.00

versus Type Platform ID 201 LAUNCHER
 4000 4020
 0.80 0.00
 0.80 0.00

versus Type Platform ID 200 T72
 15000 15020
 0.75 0.00
 0.75 0.00

versus Type Platform ID 201 LAUNCHER
 15000 15020
 0.80 0.00
 0.80 0.00

versus Type Platform ID 100 M1
 500 1000 1500 2000 2500 2510
 0.00 0.00 0.00 0.00 0.00 0.00
 0.61 0.41 0.22 0.10 0.05 0.00

versus Type Platform ID 800 ATK HELI
 5000 5600
 0.00 0.00
 0.40 0.00

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PROBABILITIES OF KILL DATABASE

Weapon ID 210 HEATSEEKER versus Type Platform ID 801 SCOUT HELI
 RANGE (KM) 0 5000 5600
 RANGED PK 0.00 0.00 0.00
 UNRANGED PK 0.50 0.40 0.00

Weapon ID 210 HEATSEEKER versus Type Platform ID 802 RPV
 RANGE (KM) 0 5000 5600
 RANGED PK 0.00 0.00 0.00
 UNRANGED PK 0.50 0.40 0.00

SEARCH SECTORS DATABASE

HORIZONTAL		VERTICAL	
FDS		FDS	
ID	(DEGREES)	ID	(DEGREES)
11	60.00	9	00
12	120.00	12	00
13	100.00	9	00
14	90.00	5	00

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The Hunter-Killer Database System

SENSORS DATABASE

ID	SPECTRUM (DEG)	HORIZ		VERTIC		FOV		SWITCH		NFOV		NFOV #2		WFOV		WFOV #2		MDT		ATR	
		WFOV	(DEG)	WFOV	(DEG)	SCALING	(SECONDS)	FOV	DELAY	CURVE	ID	CURVE	ID	CURVE	ID	CURVE	ID	CURVE	ID	CURVE	ID
1	8-12	15.00	8.00	8.00	3.00	5.00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	8-12	13.50	6.75	3.00	5.50	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	8-12	2.33	1.75	1.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The Hunter-Killer Database System

SENSOR RESOLUTION CURVES

MRC => Contrast
MRT => Temperature (degrees C)
MDT => Inverse Target Size (1/mrad) vs MDT

ID	Resolution Type	Light Level (foot-candles)	vs Frequency (cy/mrad)				vs Frequency (deg C)			
			X	Y	X	Y	X	Y	X	Y
1	MRT	0.00000	0.0000	0.0000	0.1000	1.6883	0.2000	0.2702	0.3000	3.3821
			0.5000	4.2319	0.6000	4.5154	0.7000	4.7422	0.8000	4.9279
			1.5000	5.6508	2.0000	5.8980	3.0000	6.1676	4.0000	6.3121
			6.0000	6.4634	7.0000	6.5080	8.0000	6.5418	9.0000	6.5684
2	MRT	0.00000	0.0000	0.0000	0.1000	1.6883	0.2000	2.7020	0.3000	3.3821
			0.5000	4.2319	0.6000	4.5154	0.7000	4.7422	0.8000	4.9279
			1.5000	5.6508	2.0000	5.8980	3.0000	6.1676	4.0000	6.3121
			6.0000	6.4634	7.0000	6.5080	8.0000	6.5418	9.0000	6.5684
									0.4000	3.8677
									1.0000	5.2138
									5.0000	6.4020
									10.0000	6.5898
									0.4000	3.8677
									1.0000	5.2138
									5.0000	6.4020
									10.0000	6.5898

The Hunter-Killer Database System

TYPE PLATFORMS DATABASE

ID	NAME	JOHNSON LEVEL	ID OF OWNER	COLOR (Blue/Red)	PRIORITY	ID OF WEAPON	CLASS (Ground/Air)	HEIGHT (METERS)	CROSS SECTION (SQ METERS)	DELTA T (DEGREES C)	REFLECTANCE	CONTRAST
1	IGT	1	0	-	0	0	-	0.00	0.0	0.00	0.00000	0.00
2	TRACK	2	1	-	0	0	-	0.00	0.0	0.00	0.00000	0.00
3	WHEEL	2	1	-	0	0	-	0.00	0.0	0.00	0.00000	0.00
4	WEAPON	2	1	-	0	0	-	0.00	0.0	0.00	0.00000	0.00
5	TANK	3	2	-	0	0	-	0.00	0.0	0.00	0.00000	0.00
6	ATGM	3	3	-	0	0	-	0.00	0.0	0.00	0.00000	0.00
100	M1	4	5	B	1	100	G	2.40	7.9	1.50	0.50000	0.00
101	ARTY UNIT	4	1	B	1	130	G	0.00	0.0	0.00	0.00000	0.00
200	T72	4	5	R	1	200	G	2.30	6.5	1.50	0.00637	0.00
201	LAUNCHER	4	6	R	1	210	G	1.50	2.0	1.00	0.50000	0.00
700	AIR TARGET	2	1	-	0	0	-	0.00	0.0	0.00	0.00000	0.00
800	ATK HELI	4	700	B	1	120	A	1.90	3.1	2.00	0.50000	0.00
801	SCOUT HELI	4	700	B	1	0	A	2.70	8.5	2.00	0.50000	0.00
802	RFV	4	700	B	2	0	A	1.00	1.5	2.00	0.50000	0.00

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TYPE WEAPONS DATABASE

ID	NAME	TARGET DESIGNATOR	SPEED (KM/HR)	RELOAD TIME (SECONDS)
100	M1 GUN	NONE	0	5.0
110	TOW	FIRER	350	5.0
120	HELLFIRE	SCOUT	400	5.0
130	COPPERHEAD	SCOUT	500	5.0
200	T72 GUN	NONE	0	5.0
210	HEATSEEKER	NONE	0	5.0

CONTROLS DATABASE 01

RUN CONTROLS

Variable	Value	Description
Number of Replications	10	Minutes
Replication Length	60	No / Yes
Targets in Defilade	Y	Only used when Targets in Defilade is Yes
Defilade database ID	01	Low / High
Terrain Resolution	L	Used if Terrain Resolution is Low
Terrain database ID	01	Used if Terrain Resolution is High
Mainframe Terrain file	N	No / Yes
Smoke Switch	N	No / Yes
Fixed Azimuth	N	No / Yes

OUTPUT CONTROLS

Variable	Value	Description
Echo the Data	Y	No / Yes
Report Each Replication	Y	No / Yes (Produce Initial LOS Report, Scoreboard and Sensor Performance Report for each replication)
Produce Status Reports	2	0 - 4 (0 = no status reports 1 = report only at replication start 2 = start + every report interval 3 = start + interval + every kill 4 = start + every kill)
Report Interval	15	Minutes (used when above value is 2 or 3)
Produce General Trace	N	No / Yes
Produce Search Trace	N	No / Yes
Produce Terrain Trace	N	No / Yes

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The Hunter-Killer Database System

CONTROLS DATABASE 01

SEARCH CONTROLS

Visibility 1000 meters
Minimum Detection Time 5.00 seconds
Light Level 0.000000 foot-candles

Probability of Successful Battlefield Identification, Friend or Foe

Blue Probability 0.00 (0.0 means BIFF will not be played)
Red Probability 0.00

Sky to Ground Ratios for sensors operating at:

.4 to .7 microns 3.00
.4 to .9 microns 2.66
.6 to .9 microns 2.66

Absorption Coefficients for sensors operating at:

3 to 5 microns 0.10 1/kilometers
8 to 12 microns 0.10 1/kilometers

Johnson Criteria - Number of Bars

	Contrast	Thermal
Detect	1.0	1.0
Classify	2.0	2.0
Recognize	4.0	4.0
Identify	8.0	8.0

PGM PK DEGRADATION CURVE

Range (Meters)	Fraction of PK Remaining
0	1.00
500	0.50

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DEFILADE FRACTIONS DATABASE 01

Observer Class GROUND versus Type Platform ID General Target

RANGE (KM) 0 3000
FRACTION VISIBLE 1.00 0.00

Observer Class GROUND versus Type Platform ID 100 M1

RANGE (KM) 0 3000 6000
FRACTION VISIBLE 1.00 0.60 0.00

Observer Class GROUND versus Type Platform ID 200 T72

RANGE (KM) 0 3000 7000
FRACTION VISIBLE 1.00 0.65 0.00

HUNTER-KILLERS DATABASE 01

ID	SIDE (Blue/Red)	TYPE PLATFORM	X COORD	Y COORD	HUNTER SENSOR	HUNTER LASER	HUNTER SECTOR	HUNTER AZIMUTH (DEGREES)	HUNTER JOHNSON LEVEL	KILLER SENSOR	KILLER LASER	KILLER SECTOR	KILLER AZIMUTH (DEGREES)	KILLER JOHNSON LEVEL
101	B	100	200	135	3	0	12	90	1	1	1	11	90	3
102	B	100	200	260	1	0	12	90	1	1	1	11	90	3
103	B	100	200	385	1	0	12	90	1	1	1	11	90	3
104	B	100	200	510	1	0	12	90	1	1	1	11	90	3
201	R	200	4200	20	0	0	13	90	1	2	0	11	272	1
202	R	200	4200	70	0	0	13	90	1	2	0	11	272	1
203	R	200	4200	120	0	0	13	90	1	2	0	11	272	1
204	R	200	4200	170	0	0	13	90	1	2	0	11	271	1
205	R	200	4200	220	0	0	13	90	1	2	0	11	271	1
206	R	200	4200	270	0	0	13	90	1	2	0	11	270	1
207	R	200	4200	320	0	0	13	90	1	2	0	11	270	1
208	R	200	4200	370	0	0	13	90	1	2	0	11	270	1
209	R	200	4200	420	0	0	13	90	1	2	0	11	269	1
210	R	200	4200	470	0	0	13	90	1	2	0	11	269	1
211	R	200	4200	520	0	0	13	90	1	2	0	11	268	1
212	R	200	4200	570	0	0	13	90	1	2	0	11	268	1
213	R	200	4200	320	0	0	13	90	1	2	0	11	270	1

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HUNTER-KILLERS DATABASE 01

Air Tactics

No flight teams have been defined.

Movement Controls

The movement interval is the distance a ground platform moves
each time its coordinates are updated:

Interval 100 meters

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HUNTER KILLER		VECTOR		Movement Vectors		DISTANCE		SEQUENCE NUMBER	
ID	SEQUENCE	NUMBER	AZIMUTH	ALTITUDE	TO MOVE	OF NEXT VECTOR	IN A LOOP		
			(DEGREES)	(METERS)	(METERS)				
201		1	270	0	4000	0	0		
202		1	272	0	4000	0	0		
203		1	272	0	4000	0	0		
204		1	271	0	4000	0	0		
205		1	271	0	4000	0	0		
206		1	270	0	4000	0	0		
207		1	270	0	4000	0	0		
208		1	270	0	4000	0	0		
209		1	269	0	4000	0	0		
210		1	269	0	4000	0	0		
211		1	268	0	4000	0	0		
212		1	268	0	4000	0	0		
213		1	268	0	4000	0	0		

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TERRAIN DATABASE 01

These data are only used for low resolution terrain.

The mean times in seconds that line of sight will exist and will be broken between a pair of Hunter-Killers are:

mu - LOS exists 1.000
mu - LOS is broken 0.001

Initial Line of Sight Curve

The initial line of sight curve is used to determine whether LOS exists between pairs of ground Hunter-Killers at the start of each replication. The curve gives the probability of LOS at a given range in meters.

RANGE (meters)	PROBABILITY OF LOS
0	1.00
2000	0.75
7000	0.40
10000	0.00

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RUN STREAM DATABASE 01

Last run usage - Run stream generated 9/16/83 at 12:07:20

Run description of up to four lines. The first line will appear as a header on each page of output. All four lines will appear on the first page of output.

1. STANDARD RUN
- 2.
- 3.
- 4.

The databases to be used are:

Controls 01
Hunter-Killers 01

If the following value is non-zero, it will override the visibility in the Controls database:

New Visibility 0 meters

If the following values are non-zero, they will override the sensor or laser IDs in the Hunter-Killers database:

	BLUE		RED	
	Hunter	Killer	Hunter	Killer
Sensor ID	0	0	0	0
Laser ID	0	0	0	0

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APPENDIX C - ID VERIFICATION ERRORS

This appendix contains a list of all error messages that may be produced when ID numbers are verified (option V from the main menu) as described in Section 2.8. The error numbers are of the form Id.m, where I indicates an ID error, d indicates the database as described in Section 2.1.4, and m is a sequence number. Underscores, , are used to indicate where values will appear and the number of spaces the values will occupy.

I3.1: Lasers database contains a blank record or an ID = 0

The Lasers Database contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

I4.1: PKs database Weapon ID Platform ID has invalid Weapon ID

The Probabilities of Kill Database has an invalid type weapon ID (WEAPON_ID) for the indicated weapon and type platform combination.

I4.2: PKs database Weapon ID Type Platform ID has invalid Platform ID

The Probabilities of Kill Database has an invalid type platform ID (T_PLAT_ID) for the indicated weapon versus type platform combination.

I4.3: PKs database Weapon ID has values for non 4 Type Platform ID

The Probabilities of Kill Database has values for the indicated type weapon firing at the indicated type platform. PKs are only meaningful against type platforms with a Johnson Level of 4. The level for a type platform is given by its JOHN_LEVEL attribute.

I5.1: Sectors database contains a blank record or an ID = 0

The Sectors Database contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

I6.1: Sensors database contains a blank record or an ID = 0

The Sensors Database contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

I6.2: Sensors database has Sensor ID with invalid NFOV Curve ID

The indicated sensor has a non-zero NFOV_ID that does not point to a valid curve in the Resolution Curves Database.

I6.3: Sensors database has Sensor ID ____ with invalid NFOV 2 Curve ID ____

The indicated sensor has a non-zero NFOV_2_ID that does not point to a valid curve in the Resolution Curves Database.

I6.4: Sensors database has Sensor ID ____ with invalid WFOV Curve ID ____

The indicated sensor has a non-zero WFOV_ID that does not point to a valid curve in the Resolution Curves Database.

I6.5: Sensors database has Sensor ID ____ with invalid WFOV 2 Curve ID ____

The indicated sensor has a non-zero WFOV_2_ID that does not point to a valid curve in the Resolution Curves Database.

I6.6: Sensors database has Sensor ID ____ with invalid MRT Curve ID ____

The indicated sensor has a non-zero MRT_ID that does not point to a valid curve in the Resolution Curves Database.

I6.7: Sensors database has Sensor ID ____ with invalid ATR Curve ID ____

The indicated sensor has a non-zero ATR_ID that does not point to a valid curve in the Resolution Curves Database.

I7.1: Type Platforms database contains a blank record or an ID = 0

The Type Platforms Database contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

I7.2: Type Platforms database has Platform ID ____ with invalid Weapon ID ____

The indicated type platform has a WEAPON_ID that does not point to a valid weapon in the Type Weapons Database.

I8.1: Weapons database contains a blank record or an ID = 0

The Type Weapons Database contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

I10.1: Defilade database ____ has data for ____ sensor vs invalid Platform ID ____

The indicated Defilade Fractions Database contains data for Air or Ground sensors vs an invalid type platform ID (T_PLAT_ID).

I11.1: HKS database ____ HK ID ____ has invalid type platform ID ____

In the indicated Hunter-Killers Database there is a hunter-killer with an invalid T_PLAT_ID.

I11.2: HKS database __ HK ID __ and its T_PLAT_ID are different colors

In the indicated Hunter-Killers Database there is a hunter-killer whose side (SIDE) does not match the side (COLOR) of the hunter-killer's type platform (T_PLAT_ID).

I11.3: HKS database __ HK ID __ has invalid hunter sensor ID __

In the indicated Hunter-Killers Database there is a hunter-killer with an invalid sensor ID (H_SENSOR).

I11.4: HKs database __ HK ID __ has invalid killer sensor ID __

In the indicated Hunter-Killers Database there is a hunter-killer with an invalid sensor ID (K_SENSOR).

I11.5: HKS database __ HK ID __ has invalid hunter laser ID __

In the indicated Hunter-Killers Database there is a hunter-killer with an invalid laser ID (H_LASER).

I11.6: HKS database __ HK ID __ has invalid killer laser ID __

In the indicated Hunter-Killers Database there is a hunter-killer with an invalid laser ID (K_LASER).

I11.7: HKS database __ HK ID __ has invalid hunter sector ID __

In the indicated Hunter-Killers Database there is a hunter-killer with an invalid sector ID (H_SECTOR).

I11.8: HKS database __ HK ID __ has invalid killer sector ID __

In the indicated Hunter-Killers Database there is a hunter-killer with an invalid sector ID (K_SECTOR).

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APPENDIX D - DATA VERIFICATION ERRORS

This appendix contains a list of all error messages that may be produced when a database has been edited. The error numbers are of the form Ed.m, where E indicates a data error, d indicates the database as described in Section 2.1.4, and m is a sequence number. Underscores, , are used to indicate where values will appear and the number of spaces the values will occupy.

As described in Sections 2.4 and 2.5, each time a database is edited, limited data checking is performed. If an error is found, one of the following messages is displayed. The messages do not always identify the database in which the error lies. These messages are only displayed immediately after a database has been edited so that there is no confusion about the source of the error.

E3.1: Database contains a blank record or there is an ID < 1

The Lasers Database contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

E3.2: Laser has an invalid spectrum

The identified laser has an invalid spectrum. Permissible values are 1 through 4.

E4.1: Ranged PK < 0.00 or > 1.00 at RANGE =

The Probability of Kill Database just edited has an invalid PK (RANGD_PK) at the indicated range.

E4.2: Unranged PK < 0.00 or > 1.00 at RANGE =

The Probability of Kill Database just edited has an invalid PK (UNRANGD_PK) at the indicated range.

E5.1: Database contains a blank record or there is an ID < 1

The Sectors Database contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

E6.1: Database contains a blank record or there is an ID > 1

The Sensors Database contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

E6.2: Sensor has an invalid spectrum

The identified sensor has an invalid spectrum. Permissible values are 1 through 4.

E6.3: Sensor ____ has a FOV scaling factor < 1.0

The indicated sensor has an invalid scaling factor. The value must be greater than or equal to 1.0.

E6.4: Database contains a blank record or there is an ID > 1

The Resolution Curves Database contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

E6.5: Curve ID ____ - curve type was not set

The indicated resolution curve does not have the curve type set.

E6.6: Curve ID ____ has invalid curve type _____

The indicated resolution curve has an invalid curve type.

E7.1: Database contains a blank record or there is an ID < 1

The Type Platforms Database contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

E7.2: Type Platform ____ has invalid Johnson Level - value must be 1-4

The identified type platform has an invalid Johnson level (JOHN_LEVEL).

E7.3: Type Platform ____ has OWNER_ID = 0 - this is only valid if JOHN_LEVEL=1

All type platforms must have an owner except at the lowest level of 1. The owner should have a level one less than the owned type platform.

E7.4: Type Platform ____ has invalid COLOR of _ - value must be B or R

The identified type platform is neither blue or red. Only level 4 type platforms have colors.

E7.5: Type Platform ____ has invalid CLASS of _ - value must be A or G

The identified type platform is neither air or ground. Only level 4 type platforms have a class.

E8.0: Database contains a blank record or there is an ID < 1

The Type Weapons Database contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

E8.1: Weapon ID ____ target designator was not set. Reset to NONE.

The identified type weapon did not have its target designator set. The HKDS automatically reset the value to NONE.

8.2: Weapon ID ____ has invalid designator = ____

The identified type weapon has an invalid target designator.

E10.1: Defilade Fraction Visible < 0.00 or > 1.00 at RANGE = ____

The Defilade Fractions Database just edited has an invalid fraction (FRAC_VIS) at the indicated range.

E11.1: Database Contains a blank record or there is an ID < 1

The Hunter-Killers Database just edited contains a record with an ID less than one. This may indicate an invalid ID - values must be from 1 to 999. It may also indicate the presence of a blank record that may be deleted.

E11.2: HK ID ____ has invalid hunter Johnson level of _ - value must be 1-4

The identified hunter-killer has an invalid Johnson Level to which the hunter must acquire a target before taking action (H JOHN LEV). This value is only needed if the hunter has a sensor (H_SENSOR > 0).

E11.3: HK ID ____ has invalid killer Johnson Level of _ - value must be 1-4

The identified hunter-killer has an invalid Johnson Level to which the killer must acquire a target before taking action (K JOHN LEV). This value is only needed if the killer has a sensor (K_SENSOR > 0).

E11.4: Vectors have invalid HK ID of ____

The Move Vectors Database just edited has a hunter-killer ID (HK_ID) that does not match an ID in the associated Hunter-Killers Database.

E11.5: Team _ has an invalid scout ID of ____

The indicated flight team, 1 or 2, has a hunter-killer ID for the scout (T1_SCOUT or T2_SCOUT) that does not match an ID in the associated Hunter-Killers Database.

E11.6: Team _ has an invalid attack ID of ____

The indicated flight team, 1 or 2, has a hunter-killer ID for an attack platform (T1_ATTACK1, T1_ATTACK2, T1_ATTACK3, T2_ATTACK1, T2_ATTACK2, or T2_ATTACK3) that does not match an ID in the associated Hunter-Killers Database.

E11.5: Team _ has an invalid tactic of ____ .

The indicated flight team, 1 or 2, has an invalid tactic (T1_TACTICS or T2_TACTICS).

E12.1: LOS Probability < 0.00 or > 1.00 at RANGE = ____

The Terrain Database just edited has an invalid Line of Sight Probability (PROB_LOS) at the indicated range.

APPENDIX E - RUN STREAM GENERATION ERRORS

This appendix contains a list of all error messages that may be produced when a run stream is generated (option R from the main menu). The error numbers are of the form Sm, where S indicates a run stream error and m is a sequence number. Underscores, , are used to indicate where values will appear and the number of spaces the values will occupy.

S1: ERROR - Sector ID does not exist

A hunter-killer has an invalid sector ID (H_SECTOR or K_SECTOR).

S2: ERROR - Laser ID does not exist

A hunter-killer has an invalid laser ID (H_LASER or K_LASER).

S3: ERROR - Sensor ID does not exist

A hunter-killer has an invalid sensor ID (H_SENSOR or K_SENSOR).

S4: ERROR - Hunter-Killer database calls for non-existent platform ID

A hunter-killer has an invalid type platform ID (T_PLAT_ID).

S5: ERROR - Hunter-Killer database calls for non-level 4 platform ID

A hunter-killer must be a level 4 type platform (T_PLAT_ID). This is the level that identifies a specific equipment type and defines its characteristics. Levels 3, 2, and 1 are used to group similar types of platforms with decreasing precision, with level 1 indicating only that an undefinable target has been detected.

S6: ERROR - Platform ID has invalid owner ID

A type platform called for by the Hunter-Killer Database has an owner ID that is not in the Type Platform Database (OWNER_ID).

S7: ERROR - Weapon ID does not exist

A type platform has an invalid weapon ID (WEAPON_ID).

S8: ERROR - Type Platform ID does not exist

This error duplicates errors S4 and S6: this check is made in a different part of the run stream generator than the two earlier errors.

S9: WARNING - PKs do not exist for weapon ID versus type platform ID

A weapon (WEAPON_ID) used by one of the type platforms called for by the Hunter-Killer Database does not have a probability of kill curve against one of the other type platforms (T_PLAT_ID).

S10: WARNING - Defilade Fractions not given for _____ sensors vs type platform ID ____

This message will only appear when the TARGETS IN DEFILADE control in the controls database has been set to YES. It indicates that fractions visible were not given for AIR or GROUND sensors versus one of the type platforms called for by the Hunter-Killer Database nor was a generalized fractions visible curve defined. The Hunter-Killer Model uses a fraction visible of zero in this case.

S11: ERROR - Sensor ID ____ has invalid curve ____

A sensor has an invalid resolution curve ID.